

FACT SHEET

GLOBAL TROPOSPHERIC EXPERIMENT/AMAZON BOUNDARY LAYER EXPERIMENT

Scientists from the United States and Brazil conducted a joint expedition in and above the Brazilian Amazon rain forest in July and August 1985. The expedition, the Global Tropospheric Experiment/Amazon Boundary Layer Experiment (GTE/ABLE) combined, for the first time, local measurements at ground stations, regional measurements aboard aircraft and global measurements from the space shuttle and satellites to study the influence on the troposphere of the world's largest tropical rain forest, an ecosystem of profound importance in the chemistry and meteorology of the global atmosphere.

More than 80 scientists from NASA and Brazil's Instituto de Pesquisas Espaciais (INPE) and from U.S. and Brazilian universities participated in the research project. GTE/ABLE was initiated as a joint NASA/INPE project after results from an experiment, called Measurements of Air Pollutants from Satellites (MAPS) aboard Space Shuttle Columbia's second flight, showed a sharp enhancement of carbon monoxide concentration off the northeast and northwest coasts of South America. These results suggested that combining ground-based, aircraft and space experiments in an integrated field measurement could offer a unique opportunity to study the roles of the Amazon rain forest in global atmospheric chemistry.

The biological activity in the rain forest is thought to be very important in determining trace gas chemistry in the atmosphere. Both theoretical studies and available data support hypotheses that: (1) tropical rain forest environments are characterized by relatively intense sources of biogenically produced gases and aerosols; (2) the world's largest rain forest -- in the Amazon Basin -- is a region of frequent atmospheric instability with intense thunderstorm activity, resulting in the potential for rapid mixing of biogenic gases and aerosols to high altitudes where they impact global tropospheric chemistry; and (3) the tropical troposphere is a region of intense photochemical activity where sinks for certain biogenic trace gases (e.g. isoprene) and sources of their oxidation products (e.g. carbon monoxide) may be significant relative to global budgets. Global transport of the gases originating from this region also is fostered by the presence of major atmosphere circulation patterns that originate in the tropics.

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The 1985 GTE/ABLE expedition primarily involved ground-based and aircraft components, augmented by Landsat and GOES satellite data. The experiment assessed the role of biosphere-atmosphere interactions on the chemistry of the troposphere over relatively pristine tropical forests and wetlands and on the transport of chemical species between the forests and the wetlands and on the transport of chemical species between the forest and the atmosphere.

The early phases of the Amazonian dry season were selected as the experiment period for ABLE to provide the best opportunities for characterizing the chemistry of the undisturbed (nonprecipitating) atmospheric boundary layer over tropical forests and wetlands. This period also coincides with the maximum extent of the floodplain area and the peak production of gases associated with decomposition of organic materials in wetlands. The floodplain is the mosaic of land areas -- such as flooded forests and meadows -- that change in area as the Amazon River rises and falls each year.

The Amazon ecosystem removes ozone from air in the forest and immediately overlying the forest. Concentrations of ozone are typically 40 ppb in the upper atmosphere over the Amazon, decreasing to 20 ppb in the boundary layer and go to undetectable levels at night in the forest. Thus, tropical forest ecosystems act as a filter removing ozone from air through reactions of hydrocarbon gases emitted by vegetation and by ozone uptake on soil and plant surfaces.

Large convective thunderstorms were observed to transport ozone to above 5 kilometers to the lower atmosphere where ozone removal occurs, illustrating how the biosphere at the surface interacts with the global atmosphere.

During the expedition, a NASA Electra aircraft was stationed in Manaus, Brazil, in the center of the Amazon basin. Measurements were made in the Amazon basin during approximately 75 flight hours, encompassing a variety of flight patterns designed to study the exchange of gases between the forest canopy and the troposphere in different meteorological conditions. Survey flights east and west of Manaus provided measurements over the entire basin to assess the effect on the boundary layer's chemistry as an air mass flows from the Atlantic Ocean across the basin.

Instruments aboard the aircraft made in situ and remote measurements of atmospheric trace gases and aerosols during each flight. The aircraft measurements were complemented by surface and tethered balloon measurements up to 1,000 meters at Reserva Ducke, north of Manaus, and by measurements in lake and riverine environments, west of Manaus. These measurements provided smaller scale, independent data on gas movements for correlation with the aircraft results.

Over the next few weeks, data from the definition studies and the results of the man-tended study will be presented to the NASA Administrator who will select a complete baseline configuration. Based upon the selection of a configuration, NASA will initiate and establish the preliminary design for the initial station. Current planning calls for start of Space Station development in 1987, leading toward establishment of an orbital capability in 1994.

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National Aeronautics and
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LBH

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For Release:

January 6, 1986

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RELEASE: 86-1

NASA RENAMES PLANETARY MISSIONS TO VENUS AND MARS

NASA has selected official names for two planetary missions scheduled for flight in 1988 and 1990. A mission to map the planet Venus, previously known as Venus Radar Mapper, is now called Magellan. The Mars Geoscience/Climatology Orbiter is now named Mars Observer.

The Magellan mission will map the entire surface of planet Venus for the first time, using a synthetic-aperture radar instrument. The radar -- which can image the surface despite the cloud cover that enshrouds Venus -- will map the surface with subkilometer resolution adequate enough to identify geological processes and provide information that will lead to an improved understanding of the planet's evolution. The spacecraft will orbit the planet about once every 3 hours, coming as close as 250 kilometers from the surface.

The Magellan spacecraft, attached to a Centaur-G upper stage, is scheduled for launch from the Space Shuttle in April 1988 and arrival at Venus in July 1989.

The name selection resulted from a search conducted by the NASA Headquarters Office of Space Science and Applications, aided by The Planetary Society.

The Mars Observer mission will map the planet Mars to determine the global elemental and mineralogical character of its surface and to investigate the Martian climate, both present and past.

The Observer spacecraft will be adapted from an existing, production-line type of Earth-orbital spacecraft to reduce costs. This mission will be the first in a series of low-cost planetary observer missions using this approach.

Use of the generic Observer name for a series of related space missions is in keeping with the practice established by NASA's Mariner, Pioneer and Explorer series of missions.

Mars Observer is scheduled for launch in August 1990 from the Space Shuttle. It is scheduled to arrive at Mars in August 1991.

The Magellan and Mars Observer projects are managed by the Jet Propulsion Laboratory, Pasadena, Calif., for NASA's Office of Space Science and Applications.

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January 6, 1986

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RELEASE: 86-2

NASA SWITCHES EARTH OBSERVATION MISSION AND TELESCOPE LAUNCHES

The National Aeronautics and Space Administration has switched the launch of the Hubble Space Telescope (HST) with the launch of the first Earth Observation Mission (EOM). Under the new schedule, the Space Telescope will be launched on Oct. 27 and EOM will lift off on Aug. 18, 1986.

The change was made to provide additional contingency time for the delivery of the Space Telescope from the West Coast, through the Panama Canal, to Kennedy Space Center, Fla. While satisfactory progress is being made by the major contractor, Lockheed Missiles and Space Co., Sunnyvale, Calif., to support the earlier launch date, it was deemed desirable to provide the added contingency time to insure that no slips occur in the Space Shuttle launch schedule.

A concurrent benefit obtained as a result of the change will be a significant improvement in the scientific return from the EOM. Dr. Marsha Torr, EOM mission scientist, Marshall Space Flight Center, Huntsville, Ala., explained that the Earth Mapping Metric Camera Experiment will benefit significantly from a higher sun angle and an improved chance of better weather over the primary land masses of interest in the northern hemisphere. The astronomy and plasma physics experiments also will gain from additional observing time provided by longer periods of orbital night in the southern hemisphere, Torr said.

James B. Odom, HST project manager at Marshall, emphasized that the telescope is presently on its approved schedule for delivery to Kennedy. "We still intend to deliver the Hubble Space Telescope to Kennedy on June 21 as is currently planned," according to Odom.

The Space Telescope, NASA's premier unmanned optical observatory, will be deployed into orbit from the Space Shuttle Atlantis above the Earth's obscuring atmosphere. From its Earth orbit, it will see seven times farther and with 10 times more clarity than telescopes on Earth. It also will see objects 50 times fainter than now visible.

The orbiter Atlantis will be used for both missions as previously planned. Performance characteristics of the newest orbiter will insure attainment of the altitude requirements of both missions.

The EOM and Space Telescope projects are managed by Marshall for NASA's Office of Space Science and Applications, Washington, D.C.

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RELEASE NO: 86-3

VOYAGER SPACECRAFT FINDS NEW MOON ORBITING URANUS

A new moon orbiting the planet Uranus has been discovered by the Voyager 2 spacecraft.

Voyager imaging team scientists at NASA's Jet Propulsion Laboratory, Pasadena, Calif., found the small moon in long-exposure images of Uranus and its rings taken by Voyager 2's cameras in late December. Conclusive evidence of the moon's orbit was seen in pictures taken Dec. 31, 1985 when the spacecraft was about 19 million miles from Uranus.

The new satellite of the planet, designated 1985 U1, is the sixth moon known to orbit Uranus. It is about 45 miles in diameter and occupies an orbit 53,000 miles from the center of the planet, between the moon Miranda and the outermost of Uranus' nine known rings. The moon orbits the planet every 18 hours, 17 minutes and 9 seconds.

Voyager 2 will fly by Uranus on Jan. 24, 1986. The spacecraft's trajectory has been planned to pass between the rings and Miranda. The new moon will not be in a position to endanger the Voyager 2 spacecraft as it passes by the planet.

The Voyager mission is managed by JPL for NASA's Office of Space Science and Applications, Washington, D.C.

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January 13, 1986

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RELEASE: 86-4

SCIENTISTS MAKE FIRST DEFINITE IDENTIFICATION OF WATER IN COMETS

A team of NASA and university scientists observing comet Halley in December 1985 has made the first direct confirmation of water in a comet.

The discovery, the first definite detection of neutral water in any comet, lends new support to astronomers' widely held theory that comets are "dirty snowballs" composed primarily of frozen water. The theory was first developed by astronomer Fred Whipple in 1951, but has only received indirect corroboration to date through discoveries of atoms such as oxygen and hydrogen, molecules such as OH and ions such as H₂O⁺, supposed to be the by-products of underlying ice.

"This is our first direct confirmation that neutral water is the dominant molecular species in a comet," explained Dr. Michael Mumma, head of the Planetary Systems Branch, Goddard Space Flight Center, Greenbelt, Md. The observations were made using a University of Arizona telescope aboard NASA's Kuiper Airborne Observatory.

The discovery stems from a new theoretical model developed at Goddard by Mumma and Dr. Harold Weaver, now an associate research scientist at the Center for Astrophysical Sciences, Johns Hopkins University, Baltimore, Md. The theory, which Mumma conceived and first presented in March 1980 at a conference on planetary spectroscopy, holds that the parent molecules can best be detected by measuring their infrared fluorescence spectrum stimulated by sunlight.

The theory has been developed extensively since then by the two astrophysicists and has been confirmed by independent work of scientists in France and Japan. It predicts in precise detail the wavelengths and relative intensities of infrared spectral lines emitted by gaseous water and other parent molecules in comets.

The theory also predicts that a definitive study of cometary water is not possible from conventional ground-based telescopes because of spectral line absorption by water in our own atmosphere.

This problem was minimized by using an airborne telescope and special instrumentation developed at the Lunar and Planetary Laboratory of the University of Arizona by Dr. Harold P. Larson, Dr. D. Scott Davis and Michael Williams. The Arizona group specializes in airborne spectroscopic studies of solar system objects, a program which produced, for example, the detection of water in Jupiter's atmosphere 10 years ago.

The Arizona spectrometer was used to observe comet Halley on the nights of Dec. 21, 22 and 23, 1985. The flying observatory consists of a 36-inch diameter telescope in a modified C-141 aircraft, operated by NASA's Ames Research Center, Mountain View, Calif. Observations were made at an altitude of 41,000 feet, far above that of any conventional ground-based telescope, to reduce interference by terrestrial water vapor.

Soviet and European spacecraft encountering comet Halley later this spring also will be looking for water. "Although NASA did not send a spacecraft through comet Halley, as far as the confirmation of water is concerned, the use of the Kuiper observatory was the most cost-effective way this country could have solved this central problem in cometary science," according to Larson. "This facility and its dedicated staff deserve equal recognition for the success of our project."

The theory accurately predicted the presence of 10 spectral lines of water in Halley's cometary coma, a bright cloud of gas and dust surrounding the cometary nucleus. Observations on Dec. 21 showed four of the 10 predicted lines, while observations on Dec. 23 revealed all 10. The team saw more lines on the last day because "the brightness of the water lines across the board increased by a factor of three," says Weaver. "Finding such dramatic variability in the comet's behavior was a surprise in itself." Comet variability, he notes, has been observed previously by teams observing their atomic composition and brightness.

Astronomers have been seeking to confirm the presence of water in comets for more than 20 years, first using radio astronomy telescopes and later satellites, such as the International Ultraviolet Explorer (IUE), that observe in the ultraviolet spectrum.

"These attempts largely have failed because water, like most polyatomic molecules, does not fluoresce in the ultraviolet, and the new theory shows that water's radio spectral lines are too weak to be seen," according to Weaver.

The direct detection of a major parent molecule ushers in a new era of direct investigations of the compositions of cometary nuclei and of the physics of cometary coma. Until now, scientists had to work backward, using the known fragments to infer the identities of plausible parent molecules.

This process was highly uncertain because many potential candidates could have produced the observed fragments, but it was impossible to identify any specific precursor. This discovery demonstrates that astronomers now have a powerful new tool for predicting and detecting, with accuracy, parent molecules in comets including gaseous water and other constituents.

The NASA/university team plans to observe comet Halley again, March 21 through 27 from the Kuiper observatory in Australia, both for water and methane, in an effort to compile the first complete map of a cometary coma for these substances.

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NOTE TO EDITORS: A photograph of comet Halley, taken on Dec. 7, 1985, is available on request. Call the Goddard Space Flight Center Public Affairs Office at 301/344-8955.

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January 14, 1986

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RELEASE: 86-6

NASA SIGNS AGREEMENT WITH SPACEHAB, INC.

The National Aeronautics and Space Administration has signed a memorandum of understanding with SPACEHAB, Inc., Seattle, Wash. The memorandum establishes a framework for cooperation in SPACEHAB's efforts to develop and market payload bay habitable modules that would augment the pressurized volume of the Space Shuttle.

The SPACEHAB modules would be truncated metal cylinders, 10 ft. long and 13 ft. in diameter, connected to the orbiter crew compartment airlock by tunnel adaptors. The modules would provide additional living and working space for astronauts to conduct experiments in the microgravity environment of space.

NASA and SPACEHAB have agreed to enter into negotiations to reach agreement on a number of technical and other issues related to the use of SPACEHAB in the Shuttle. There will be no exchange of funds under the memorandum.

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January 14, 1986

RELEASE NO: 86-7

REMOTE SENSING AGREEMENT REACHED BY NASA AND ESA

Dr. William R. Graham, NASA Acting Administrator, and Professor Reimar Luest, Director General of the European Space Agency (ESA), have signed a memorandum of understanding on NASA/ESA cooperation in connection with the first European Remote Sensing Satellite (ERS-1).

Under the memorandum, ESA has agreed to permit direct readout of ERS-1 Synthetic Aperture Radar (SAR) data for U.S. government research purposes at the Fairbanks, Alaska, station that NASA is developing in connection with its Navy Remote Ocean Sensing Satellite System Scatterometer (NROSS) program. In addition to the C-band SAR, ERS-1 will have a C-band scatterometer, radar altimeter, microwave sounder and a precise positioning system.

ERS-1 is planned for launch in 1989 and will have a 3-year projected lifetime with the possibility of a second flight unit to be launched in 1992/93.

Under the agreement, NASA also will exchange its scatterometer and radar imagery for other ERS-1 data of interest. The data received from ERS-1 should enhance NASA-supported polar ice research and complement NASA experimental activities related to NROSS, the Topography Experiment for Ocean Circulation (TOPEX) and Shuttle Imaging Radar-C, all of which are projected to operate in the same timeframe as ERS-1.

The agreement maintains a tradition of remote sensing collaboration between NASA and ESA for the benefit of the international research and application user community. In permitting NASA direct data readout from ERS-1, ESA reciprocates similar provisions made by NASA for European data readout from the Seasat and Nimbus-7 spacecraft.

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January 16, 1986

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RELEASE 86-8

SIX NEW MOONS DISCOVERED ORBITING URANUS

NASA's Voyager 2 spacecraft has found six additional small moons in orbit around the planet Uranus -- doubling the number of known Uranian satellites.

Scientists on the Voyager imaging team found the moons in long-exposure images returned by the spacecraft over the past 2 weeks. The exposures were designed to search for new moons or rings.

To date, seven new Uranian moons have been found around the distant planet in images returned by the spacecraft.

Like 1985U1, the moon discovered by Voyager scientists in late December, the new satellites are all in orbits between the outermost known ring (the epsilon ring) and the moon Miranda. The moons are temporarily called by designations which state the year in which they were discovered (1986), the planet with which they are associated (U for Uranus), and the order in which they were discovered during the year.

The new satellites are:

--1986U1, 30 miles in diameter, orbiting at a distance of 41,070 mi. from the center of the planet every 12 hours, 19 minutes. It was discovered in images returned Jan. 3rd.

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--1986U2, about 25 mi. in diameter, orbiting at a distance of 39,990 mi. every 11 hours, 50 minutes. It also was found in images returned Jan. 3.

--1986U3, about 25 mi. in diameter, orbiting at a distance of 38,370 mi. every 11 hours, 8 minutes. It was found Jan. 9.

--1986U4, about 20 mi. in diameter, orbiting at a distance of 43,450 mi. every 13 hours, 24 minutes. It was discovered Jan. 13.

--1986U5, about 20 mi. in diameter, orbiting at a distance of about 46,700 mi. every 14 hours, 56 minutes. It was found Jan. 13.

--1986U6, 20 mi. in diameter, orbiting at a distance of about 39,000 mi. every 11 hours, 24 minutes. It also was found in data returned Jan. 13.

Voyager scientists expect to still find more Uranian satellites, both in and around the rings, in images returned by the spacecraft over the next 2 weeks.

The Voyager project is managed by the Jet Propulsion Laboratory, Pasadena, Calif. for NASA's Office of Space Science and Applications, Washington, D.C.

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For Release:

February 10, 1986

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RELEASE: 86-10

UNITED STATES AND UNITED KINGDOM SIGN RESEARCH AGREEMENT

The United States and the United Kingdom recently signed a memorandum of understanding for a cooperative research program addressing an advanced short takeoff and vertical landing (ASTOVL) aircraft concept.

The memorandum was signed by Dr. William R. Graham, NASA Acting Administrator, and Dr. Donald A. Hicks, Under Secretary for Research and Engineering, Department of Defense, for the United States. Sir David Perry, Chief of Defense Equipment Collaboration, signed for the United Kingdom.

The broad objective of the agreement is to create an environment which encourages collaboration between the United States and United Kingdom governments and their industries to develop technology for ASTOVL aircraft. The aim is to reduce the technological risk associated with potential future ASTOVL combat aircraft. These aircraft will have the capabilities of an advanced supersonic fighter aircraft with the added advantage of landing vertically when necessary.

The research program will investigate four propulsion concepts: vectored thrust, ejector augmentor, tandem fan and remote augmented lift system. The program will assess the relative potential as well as the joint research required for advancement of these technologies to future ASTOVL aircraft.

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The two governments envisage the possibility of undertaking a joint experimental aircraft activity that could lead to the production of new generation ASTOVL aircraft, should there be a requirement for such aircraft. Should the joint work be undertaken, it will be covered by separate agreements.

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NOTE TO EDITORS:

NASA will hold a briefing for U.S. industry and news media representatives on the U.S./U.K. Advanced Short Takeoff and Vertical Landing (ASTOVL) technology program on Feb. 14, 1:00 p.m. PST at NASA's Ames Research Center, Mountain View, Calif. The briefing will be held in building 245, 2nd floor conference room. Please contact Donald James, Public Information Officer, Ames Research Center, 415/694-5091 for further information.

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February 10, 1986

Release 86-11

NASA POSTPONES GALILEO, ULYSSES, ASTRO-1 LAUNCHES

NASA announced today that it has postponed the Ulysses mission to investigate the poles of the sun and the Galileo mission to orbit Jupiter and send a probe into that planet. Both spacecraft were scheduled to be launched by the Space Shuttle in May.

The agency also announced it would not launch the Astro-1 mission, scheduled to fly in March. Astro-1 is an ultraviolet astronomy laboratory mounted in the Shuttle's payload bay that was to examine quasars, "hot" stars, galaxy centers and Halley's Comet.

The decisions on Galileo and Ulysses were made by Dr. William R. Graham, NASA acting administrator, after consultations with senior officials of the German Research and Technology Ministry and the European Space Agency. Graham said the decision not to launch in May "does not reflect a judgement that the resumption of Space Shuttle launch operations would necessarily be postponed until after the launch opportunity for either Galileo or Ulysses."

Graham said the decision took into account two principal factors:

- "1. Key personnel required to assure a safe and successful launch of either Galileo or Ulysses are preoccupied with the timely analysis of causes of the 51-L accident.
- "2. The consequences of the accident have significantly eroded the schedule margins for launch site processing required prior to the first flight of the Shuttle/Centaur upper stage."

An upper stage is a rocket attached to the spacecraft. It is used to boost a spacecraft on its mission from low-Earth orbit after it has been deployed from the Space Shuttle. Two orbiters were modified to carry the missions, Atlantis and Challenger. Challenger was destroyed in the accident on Jan. 28.

Although the missions have been postponed, NASA will proceed with planned tests to ensure that all interfaces between the spacecraft, their upper stages, the Shuttle and the launch facilities are validated prior to launch.

Revised launch dates will be determined after a schedule for resumption of Shuttle launches has been established.

Due to their trajectory requirements, both the Galileo and Ulysses missions are dependent on the relative positions of Jupiter and the Earth at launch time. (Ulysses also must be sent to Jupiter to get a gravity assisted boost to reach the sun). Jupiter must be almost directly on the opposite side of the sun from Earth at the time of launch if it is to be in the required location at the time of spacecraft arrival. This geometric arrangement occurs once every 13 months. Therefore, for a direct launch to Jupiter, both missions would be delayed at least 13 months until another favorable launch window occurred.

Astro-1 had to be launched in the March-April time frame to observe Halley's Comet. With that opportunity gone, a new, specific launch date request for the mission has not yet been established.

However, scientists are anxious to get the mission into space because of the observatory's capabilities. In addition to the unique ultraviolet observations it can make of celestial objects, Astro-1 could complement the observations of the Hubble Space Telescope. It is capable of wide-field observation of heavens. Scientists would use these observations to select the most interesting targets for detailed investigation by the Space Telescope.

A new launch date will be selected in the future.

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For Release:

February 12, 1986

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RELEASE NO: 86-12

TEACHER IN SPACE PROGRAM TO CONTINUE

Dr. William R. Graham, Acting NASA Administrator, following a meeting with leaders of educational associations and teacher in space finalists, today affirmed the agency's plan to continue the educational programs developed in conjunction with the Teacher in Space Project.

In the announcement Dr. Graham reiterated President Reagan's statement that "...There will be more Shuttle flights and more Shuttle crews and yes, more volunteers, more civilians, more teachers in space. Nothing ends here. Our hopes and our journeys continue."

The original and continuing goals of NASA's Educational Affairs Division, established in 1960, are to increase the prestige of the teaching profession, to increase the awareness in the education community of the impact of technology and science on this country's future and to use space as a catalyst to enhance all subject areas and grade levels of our education systems. These goals have been an inherent part of NASA's educational outreach program since its education office was established in 1960. The Teacher in Space Program represents an amplification of those goals.

NASA's Educational Affairs Division, under the direction of Dr. Robert Brown, has received widespread support for the continuation of the program from teachers, students, the private sector and the general public since the tragedy. Educational organizations and entities such as the Department of Education, National Education Association, American Federation of Teachers, National Science Teachers Association, the Young Astronaut Council, the U.S. Space Camp and the Public Broadcasting Service also support continuation.

NASA plans include the following:

- o Barbara Morgan will assume a leadership role in the Teacher in Space Program from NASA Headquarters when the Shuttle program resumes.
- o The eight finalists will continue their efforts to promote the educational goals of the program. Each finalist is working on special projects.
- o The 103 Space Ambassadors, finalists in the Teacher in Space Project, have rededicated their commitment to take an active role in their states to motivate young people to expand their horizons in preparation for the future.
- o PBS and public television remain strong advocates of the program and will continue to produce and disseminate educational materials about the space program.
- o The Teacher in Space Teacher's Guide, the concept-based activities designed to strengthen critical thinking and problem-solving skills, will be useful in conjunction with all Shuttle missions.
- o "Partnerships in Education" initiated with major national education associations will be developed further.

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For Release:

February 19, 1986

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RELEASE NO: 86-14

BOEING AEROSPACE SELECTED FOR TDRS UPPER STAGE CONTRACT

The National Aeronautics and Space Administration has selected Boeing Aerospace Co., Seattle, for negotiations leading to the award of a contract to provide Shuttle upper stages to place two Tracking and Data Relay Satellites -- TDRS-E and TDRS-F -- into geosynchronous Earth orbits.

In addition to providing Shuttle upper stage hardware, the contractor will provide engineering, support and integration of the upper stages with the satellites, and support to the cargo (the combined upper stage and satellite) integration with the Space Transportation System. The contractor also will be responsible for postflight evaluation reports.

The contract is expected to run from March 1986 through April 1990 with a proposed price of approximately \$93 million. It is anticipated the agreement will be a fixed-price-incentive contract with incentives on cost, schedule and performance. The contract will contain options for storage of the upper stages.

Other firms submitting proposals were TRW Inc., Redondo Beach, Calif.; Orbital Sciences Corp., Vienna, Va.; and General Dynamics, Convair Division, San Diego.

Marshall Space Flight Center, Huntsville, Ala., manages the Inertial Upper Stage project and Goddard Space Flight Center, Greenbelt, Md., manages the TDRS project for NASA.

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Space Administration

Washington, D.C. 20546
AC 202-453-8400

For Release:

David W. Garrett
Headquarters, Washington, D.C.
(Phone: 202/453-8400)

Feb. 20, 1986
10:00 a.m. EST

RELEASE NO: 86-15

TRULY APPOINTED SPACE FLIGHT ASSOCIATE ADMINISTRATOR

Rear Admiral Richard H. Truly, USN, Commander of the Naval Space Command, has been appointed Associate Administrator for Space Flight, NASA Headquarters, effective immediately.

Truly will head NASA's Space Shuttle program and will assume direction of the agency's Design and Data Analysis Task Force which is reviewing the Shuttle Challenger accident of Jan. 28, 1986. In both roles, he succeeds Jesse W. Moore.

Moore will assume the post of Johnson Space Center Director, an appointment that was announced on Jan. 23.

Truly was designated a naval aviator in 1960. His initial tour of duty was in Fighter Squadron 33, where he flew F-8 Crusaders and made more than 300 carrier landings. From 1963 to 1965, he was first a student and later an instructor at the U.S. Air Force Aerospace Research Pilot School, Edwards Air Force Base, Calif. In 1965, he was among the initial military astronauts selected to the USAF Manned Orbiting Laboratory program. He became a NASA astronaut in 1969 and spent 14 years with NASA.

Truly was pilot for one of the two-man crews that flew the Shuttle Enterprise approach and landing test flights in 1977. He was then assigned as backup pilot for STS-1, the first orbital flight test of the Space Shuttle. His first space flight was STS-2 (Nov. 12-14, 1981) as pilot of the Shuttle Columbia. He was commander of STS-8 (Aug. 30-Sept. 5, 1983), the Shuttle Challenger, the first night launch and landing in the Shuttle program.

Truly became the first commander of the Naval Space Command upon its commissioning on Oct. 1, 1983. The Command is responsible for management and operational control of all Navy satellites in use and provides direct space system support to the fleet worldwide.

After attending schools in Fayette and Meridian, Miss., Truly enrolled as an NROTC midshipman at the Georgia Institute of Technology in 1955. He received a bachelor of aeronautical engineering degree and was commissioned an Ensign in the U.S. Navy in 1959.

Truly has received numerous Defense, Navy and NASA awards. He also is the recipient of the Robert H. Goddard Memorial Trophy, the Thomas D. White Space Trophy and the Robert J. Collier Trophy.

Truly is married to the former Colleen Hanner of Milledgeville, Ga. They have three children.

- end -

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NASA News

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Washington, D.C. 20546
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David W. Garrett
Headquarters, Washington, D.C.
(Phone: 202/453-8400)

For Release:

February 22, 1986

RELEASE: 86-16

NASA SPACE FLIGHT DEPUTY ASSOCIATE ADMINISTRATOR NAMED

Richard H. Truly, appointed Associate Administrator for Space Flight, NASA Headquarters, Washington, D.C., on Thursday, February 20, 1986, issued the following statement today:

I am appointing Thomas L. Moser as Deputy Associate Administrator for Space Flight effective Monday, February 24. Tom currently is Director for Engineering at NASA's Johnson Space Center, Houston, and is widely respected at all NASA centers. He will be concerned with the day-to-day activities of the Office of Space Flight, as distinguished from the inquiry into the accident that destroyed the Space Shuttle Challenger.

I intend to appoint a vice-chairman of the NASA Data and Design Analysis Task Force, which is collecting facts about the accident. The vice-chairman will be my personal representative on the task force and will supervise its daily activities, which will allow us to serve and support the Commission in the most effective manner. Commission Chairman Rogers and I had a good discussion Friday morning about this and other normal relations between NASA and the Commission.

I intend to go to the Kennedy Space Center early next week to familiarize myself with the structure of the NASA inquiry organization, the work it has done so far and the courses it is pursuing.

I am keenly aware of the depth of public interest and concern about our efforts to understand and respond to the causes of the accident. In response to the keen interest and concern in this investigation, I intend to establish a routine and smooth flow of information to the press in keeping with long-established NASA traditions.

- more -

- 2 -

I wish to state emphatically that while NASA grieves deeply for the good people lost in the accident, the NASA can-do spirit is intact. We are busy searching for the cause of this accident. After that, we are going to fix it, then get back on the track of exploring and exploiting space.

- end -

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For Release:

Gene Guerny
Headquarters, Washington, D.C.
(Phone: 202/453-8428)

February 25, 1986

Tony Diamond
Headquarters, Washington, D.C.
(Phone: 202/453-8745)

RELEASE: 86-17

NASA POSTPONES EXCELLENCE AWARD

Additional workloads related to the STS 51-L Shuttle accident of January 28, 1986 have resulted in a decision not to make an Excellence Award for Quality and Productivity for 1985, NASA announced today.

The award was to be given to NASA hardware contractors, subcontractors and suppliers who have demonstrated sustained excellence or outstanding achievements in quality and productivity. At the time of the cancellation of the 1985 awards program, the six finalists selected included Life Systems, Inc., Cleveland, Ohio; Martin Marietta Michoud, New Orleans, La.; McDonnell Douglas Astronautics Co., Huntington Beach, Calif.; Reynolds Metals' Company, McCook Sheet & Plate Plant, McCook, Ill.; Rockwell International Space Transportation Systems Division, Downey, Calif.; and United Technologies Pratt and Whitney Government Products Division, West Palm Beach, Fla.

The six finalists and the American Society for Quality Control (ASQC), Milwaukee, Wisc., who is administering the award program for NASA, will participate in a series of seminars and conferences throughout the United States to demonstrate their Product Improvement and Quality Enhancement Program. Two presentations will be made at the NASA/Contractor Productivity Conference at NASA's Ames Research Center, Mountain View, Calif. on May 7-8, 1986, and the ASQC Annual Quality Congress at Anaheim, Calif. on May 19, 1986.

In addition to hardware contractors, NASA support services contractors also will be eligible for the 1986 award program with the details for them and the previously qualified hardware contractors to be released in June, 1986. The judging will continue throughout 1986 with final selections made in early 1987.

The award for excellence is a part of NASA's Productivity Improvement and Quality Enhancement Program. NASA is continuing its efforts to improve quality and productivity and projects that this excellence award will continue to be a prize sought after by its contractors and subcontractors. The objectives of the NASA award are to create public awareness of the importance of quality and productivity to the United States in international economic competition; to encourage industry to seek excellence in products and services; and to promulgate award winners' methods of achieving quality and productivity excellence.

- end -

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LE

For Release:

David W. Garrett
Headquarters, Washington, D.C.
(Phone: 202/453-8400)

February 27, 1986

RELEASE: 86-18

U.S. SPACE FOUNDATION OUTLINES CHALLENGER 7 FUND

NASA issued the following statement today concerning United States Space Foundation plans to raise funds for construction of a replacement Space Shuttle orbiter Challenger. The statement follows:

The United States Space Foundation has outlined to NASA officials plans to provide a central national focal point for a variety of individual fund raising activities related to construction of a replacement orbiter for the Challenger.

The foundation is a private, non-profit, educational organization established to stimulate international dialogue on the beneficial uses of space and to integrate space education materials into the curriculum of schools at all levels.

Pursuant to its plan, the foundation has established the Challenger 7 Fund which already has received significant dollar contributions and has marshalled the support of a number of individuals and organizations. The foundation ultimately plans to donate the contributions to NASA for its use in financing a replacement orbiter should the U.S. Congress authorize a replacement.

Acting NASA Administrator Dr. William R. Graham, after having been advised of the foundation's plans, praised the basic thrust of the plans and commented, "I believe that activities of this nature are very responsive to the wishes and the support provided by Americans in response to the Challenger tragedy."

"When and if a replacement orbiter is authorized and pending legislation to permit NASA to accept donations is in place, we will be pleased and honored to accept private contributions through the auspices of the foundation and from other sources," Graham continued.

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- 2 -

"It would be a fitting way for individuals and organizations to participate in the Space Shuttle program and to honor the Challenger crew," Graham said.

- end -

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For Release:

William Marshall, Jr.
Headquarters, Washington, D.C.
(Phone: 202/453-1548)

February 28, 1986

RELEASE 86-19

INTERNATIONAL GROUP MEETS FOR HALLEY'S COMET ENCOUNTER

Dr. Burton I. Edelson, NASA, Associate Administrator, Office of Space Science and Applications, will lead a delegation to participate in a special meeting of the Inter-Agency Consultative Group (IACG) on Comet Halley, March 4-9 in Moscow and March 12-14 in Darmstadt, Federal Republic of Germany.

These meetings culminate an international effort spanning more than 5 years of coordination and planning of comet observations. The meetings also are timed to coincide with the Soviet Union's Interkosmos Council VEGA 1 and 2 (March 6 and 9) and the European Space Agency's (ESA) Giotto mission (March 13) flybys of the comet.

In the past 15 months, five space missions have been launched and targeted to encounter Halley's Comet passage around the sun. These missions are: ESA's Giotto, the Interkosmos Council's VEGA 1 and 2, and Japan's Institute for Space and Astronautical Science (ISAS) Suisei (Comet) and Sakigake (Pioneer) spacecraft.

NASA's plans to observe Halley's Comet from Earth orbit, using a Spartan UV telescope and the Astro UV telescopes, were terminated after the Space Shuttle Challenger accident. However, NASA's Pioneer-Venus spacecraft, launched in May 1978, has recently completed 5 weeks of its planned 7 weeks of observations of the comet. Additionally, the International Cometary Explorer spacecraft, launched in August 1978, will monitor Halley's solar wind upstream.

The Solar Maximum Missions' coronagraph instrument, launched in February 1980, has taken several photographs of the comet when it was near perihelion. All three U.S. missions will provide data complementary to the Halley intercept missions.

Significantly, the international coordination among IACG member agencies will greatly improve navigational data to target ESA's Giotto spacecraft. NASA's Jet Propulsion Laboratory will provide the Deep Space Network (DSN) to track the Intercosmos Council's VEGA spacecrafts which, in turn, will acquire images of comet Halley. ESA will use the DSN data and images of the comet provided by the VEGA project to better determine the position of the comet prior to the final Giotto trajectory targeting maneuver.

The IACG, formed in 1981, is comprised of representatives from NASA, ESA, the USSR's Intercosmos Council, Japan's ISAS and the International Halley Watch.

The NASA delegation to the Inter-Agency Consultative Group Comet Halley meeting is as follows:

Dr. Burton I. Edelson, Associate Administrator, Office of Space Science and Applications, NASA Headquarters, Washington, D.C.

Dr. Geoffrey A. Briggs, Director, Division of Solar System Exploration, Office of Space Science and Applications, NASA Headquarters

P. Diane Rausch, Division of International Affairs, Office of External Relations, NASA Headquarters

Dr. Jack Brandt, Laboratory for Astronomy and Solar Physics, NASA Goddard Space Flight Center, Greenbelt, MD.

Dr. Frank Jordan, Deputy Director, Systems Division, NASA Jet Propulsion Laboratory, Pasadena, Calif.

Dr. Frederick Scarf, Chief Scientist, Division of Space and Technology, TRW, Redondo Beach Calif.

Professor David Morrison, Institute for Astronomy, University of Hawaii, Honolulu

Professor James Head, Department of Geology, Brown University, Providence, R.I.

- end -

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David W. Garrett
Headquarters, Washington, D.C.
(Phone: 202/453-8400)

For Release
March 1, 1986

RELEASE NO: 86-20

THOMPSON TO MANAGE NASA TASK FORCE

The appointment of James R. Thompson, Princeton University, as vice-chairman of the NASA task force inquiring into the Challenger accident, was announced today by Rear Adm. Richard H. Truly, Associate Administrator for Space Flight.

The NASA 51-L Data and Design Analysis Task Force is collecting and analyzing information related to the accident in support of the Presidential Commission assigned to perform the investigation. President Reagan, who created the commission Feb. 3, directed it to determine the causes of the accident and report to him and the Administrator of NASA within 120 days.

Thompson, 49, has been the deputy director for technical operations at the Princeton Plasma Physics Laboratory since April, 1983. Before that he spent 21 years with NASA at the Marshall Space Flight Center, Huntsville, Ala., where he managed development of the Space Shuttle's main engines for eight years. He also worked in the Skylab program and was Associate Director of Engineering for the center.

Truly, who was appointed head of NASA's Office of Space Flight Feb. 20, serves as Associate Administrator in charge of the Space Shuttle program with the additional responsibility of task force chairman. He said Thompson, as vice-chairman, will manage the task force's day-do-day operations.

"I want to say how fortunate we are to have J.R. join in this inquiry into the accident," Truly said. "He is well known in the scientific community in connection with the work being done at Princeton in fusion energy research, and is respected throughout the NASA community as a thorough and tough-minded engineering and scientific manager. He is well suited to managing such a comprehensive inquiry and bringing all the strands together so we can understand what happened."

Truly also announced a structure for the task force that, he said, will parallel the organizational structure of the Presidential commission and facilitate transfer of information from the NASA task force to the commission. The NASA task force replaces the interim inquiry board set in place immediately following the accident.

The task force will have four analysis teams: project analysis, launch systems and processing analysis, failure analysis and mission operations analysis. There will be two support groups: salvage support and photo and television support.

Truly said that the directors of these teams would be announced as soon as arrangements have been made to bring the individuals aboard.

-end-

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For Release:

Mark Hess
Headquarters, Washington, D.C.
(Phone: 202/453-1192)

February 28, 1986

Terry White
Johnson Space Center, Houston, Texas
(Phone: 713/483-5111)

RELEASE NO: 86-21

HUTCHINSON LEAVES SPACE STATION POST

NASA's Johnson Space Center (JSC), Houston, has announced that Space Station program manager Neil Hutchinson will step down from that job for personal reasons effective Feb. 28, 1986. He was named program manager in April 1984 shortly after NASA formed the program office and assigned overall responsibility to JSC.

Hutchinson will remain with JSC as assistant to the director of space operations. John W. Aaron, currently deputy program manager, will be acting program manager until a replacement is named.

NASA Acting Administrator William R. Graham said, "Neil has been instrumental in forging the agency's Space Station team and has led the project through its critical conceptual and initial design phases to the point we are ready to move on to final design and construction phases. Neil's successful management of our Space Station effort required considerable personal sacrifice on his part, and I am pleased that he plans to continue in a senior capacity at NASA."

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For Release:

James W. McCulla
Headquarters, Washington, D.C.
(Phone: 202/453-8400)

March 3, 1986

RELEASE NO: 86-22

NASA REPLANNING ACTIVITIES

NASA announced today that it is engaged in a comprehensive project to evaluate the implications of the Jan. 28 Challenger accident on the space program.

The agency already has announced postponement of the Ulysses mission to observe the poles of the sun and the Galileo mission to orbit Jupiter and send a probe into its atmosphere. Both were scheduled to be launched in May. The earliest they can be launched is July 1987 when Earth, the sun and Jupiter will be in the proper alignment.

Also already announced is postponement of the launch of Astro-1, a Space Shuttle astronomical laboratory that was to do ultraviolet studies of quasars, "hot" stars, galaxy centers and Halley's Comet.

These decisions by Acting NASA Administrator, Dr. William R. Graham, resulted from an analysis prepared by a Headquarters Replanning Task Force set up to study program alternatives in the wake of the accident. The Replanning Task Force is headed by Dr. Raymond S. Colladay, Associate Administrator for Aeronautics and Space Technology.

Being consulted are Congressional committees, the Department of Defense and other branches of government, commercial launch customers, joint endeavor agreement development partners, the international community, contractors and others.

Graham announced today that an additional decision has come out of the study group's work. An order has been issued to have the Shuttle orbiter Discovery modified to enable it to carry cargoes with the Centaur upper stage. An upper stage is a rocket attached to a spacecraft to propel it to geosynchronous orbit from low-Earth orbit where it is deployed by the Space Shuttle.

-more-

The Centaur is an especially powerful upper stage designed to launch planetary missions. Modification would allow both the Ulysses and Galileo missions to be launched in July 1987, and give the orbiter fleet more flexibility. With Challenger's loss, only Atlantis is now capable of carrying Centaur payloads.

The following is a list of matters being considered by the task force:

1. Reviewing the requirements for an orbiter and ancillary equipment to replace the Challenger, structural spares to replace existing spares that would be used to build the replacement, funds to make any corrections to the Space Shuttle that result from the accident investigation and replacement of Inertial Upper Stage (IUS) airborne support equipment. The lost IUS and its support structure were attached to a Tracking and Data Relay Satellite, also lost.

2. Producing a new launch schedule for the fleet of three orbiters, possibly supplemented by expendable launch vehicles, based on priorities assigned to various payloads of cargo and the urgency of individual payloads.

Schedulers have been instructed to evaluate alternative approaches based on 12- or 18-month delays before resumption of Space Shuttle flights. Payload categories in the replanning process include national security, scientific with specific launch windows such as the Ulysses and Galileo planetary missions, other U.S. government, and foreign and domestic commercial payloads such as communications satellites.

3. Bringing the West Coast launch site at Vandenberg Air Force Base, Calif., on line. NASA would assign an orbiter for several weeks of "pathfinder" work in the development process.

4. Evaluating the role that expendable launch vehicles (ELV) can play in recovering launch capability through commercial ELV production and operation. Some of the factors include the priority customers assign to their individual payloads, considerations of cost to customers, availability of ELVs, their performance capability, foreign competition and the opportunity for the development of a private commercial launch capability in the United States.

5. Deciding on retention of ground communications stations. The ground stations around the world, which link spacecraft to Earth, were being phased out with expansion of the TDRS system. Because of the accident, only one TDRS is now on orbit, rather than the planned two.

6. Identifying cost impacts of the accident in addition to the equipment destroyed. Some already identified include Challenger salvage operations and retention of tracking stations.

Cost reductions will include a slow down in the Galileo and Ulysses programs, reduced procurement of Shuttle external tanks and solid rocket boosters, and reduced manpower costs associated with the gap in the Shuttle flight schedule.

The NASA Replanning Task Force is meeting daily.

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NASA News

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March 6, 1986
9:30 A.M. EST

Leon N. Perry
Headquarters, Washington, DC
(Phone: 202/453-1547)

RELEASE: 86-23

NASA TO TELEVISION SPACECRAFT'S ENCOUNTER WITH HALLEY'S COMET

NASA will televise the European Space Agency's (ESA) Giotto spacecraft images of Comet Halley during the spacecraft's encounter with the comet on Thursday, March 13, 1986.

The Giotto spacecraft, travelling at velocity of 154,000 mph, will encounter Comet Halley at a distance of about 300 miles from the comet's nucleus. Of the several spacecraft headed for a rendezvous with Halley's comet, Giotto will obtain the highest resolution imaging of the comet's nucleus. Because of anticipated repeated impacts from dust and debris, the spacecraft may not survive its closest approach.

There are more than 30 United States scientists serving as co-investigators on the Giotto mission. The number includes several who are members of the television team which will analyze the historic data sent back from the Halley comet encounter. NASA also is providing navigation and tracking assistance to the Giotto mission through use of the NASA Deep Space Network.

At a distance of about 300 miles from the nucleus, Giotto's solid state camera will have a spatial resolution of less than 100 feet on the surface. The spacecraft also is equipped with neutral and ion mass spectrometers, dust mass spectrometer, dust impact detector, fast ion and implanted ion sensors, electron electrostatic analyzer, positive ion cluster composition analyzer, energetic particles detector and a magnetometer.

Launched in July 1985, Giotto is part of a five spacecraft armada headed for a rendezvous with Halley's comet. Included are two spacecraft from the Soviet Union (Vega 1 and 2) and two spacecraft from Japan (Suisei and Sakigake).

NASA Select television of the Giotto transmissions may be obtained through SatCom F2R, transponder 13, located at 72 degrees west longitude. The transponder operates at 3954.5 MHz (vertical polarization).

The broadcast schedule for the Giotto transmissions are:

GMT	EST	Approx. Duration (min.)
1950	2:50 pm	8
2055	3:55 pm	15
2110	4:10 pm	6
2155	4:55 pm	8
2330	6:30 pm	60

(Changes to the above video schedule are possible because of updated timeline computations.)

The television programming will include Giotto status reports, encounter background information and animation, control room activities, pre-recorded comet images from Moscow (Vega 1) and Chile and real time images from Giotto's onboard camera system.

- end -

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For Release:

March 6, 1986
9:30 a.m. EST

Sarah Keegan
Headquarters, Washington, D.
(Phone: 202/453-8400)

RELEASE NO: 86-24

NASA TASK FORCE ASSIGNMENTS DETAILED

Rear Admiral Richard H. Truly, Associate Administrator for Space Flight, today announced assignments to the NASA 51-L Data and Design Analysis Task Force. The task force is collecting and analyzing information to support a thorough review of all aspects and potential causes of the accident in support of the Presidential Commission assigned to perform the investigation. The task force, designed to parallel closely the recently announced structure of the Presidential Commission, will facilitate transfer of information from the NASA task force to the commission.

Personnel assigned to the task force include: Truly, chairman; James R. Thompson, vice chairman; Robert Crippen, NASA astronaut; Col. (BGen Selectee) Nathan Lindsay, Commander, Eastern Space and Missile Center; Joseph Kerwin, Director, Space and Life Sciences, Johnson Space Center; Walter Williams, Special Assistant to the NASA Administrator; and the team leaders and deputies of the analysis teams, which follow, along with the specific responsibility of each team.

Project Analysis Team

- * Design, development, test and evaluation
- * Production and acceptance test

Leader - Thomas (Jack) Lee, Deputy Director,
Marshall Space Flight Center

Deputy - Clay McCullough, Manager,
Support Equipment and Logistics Office,
Johnson Space Center

Launch Systems and Processing Analysis Team

- * Shuttle system processing
- * Launch readiness
- * Pre-launch security

Leader - Thomas Utsman, Deputy Director,
Kennedy Space Center

Deputy - Col. Robert Bourne, Director,
Space Shuttle Operations, Vandenberg AFB

Failure Analysis Team

- * Accident data base
- * Anomaly tree development
- * Scenario development

Leader - Alton Jones, Director of Flight Assurance,
Goddard Space Flight Center

Deputy - John Thomas, Manager, Spacelab Program Office,
Marshall Space Flight Center

Mission Operations Analysis Team

- * Shuttle mission planning
- * Mission operations
- * Schedule pressures
- * Crew safety

Leader - Tommy Holloway, Chief, Flight Director Office,
Johnson Space Center

Deputy - Harold Draughon, Manager,
Mission Integration Office, JSC

The task force organization also will include two support teams which will not be involved in the actual analysis of information.

Salvage Support Team

- * Debris location and recovery
- * Reconstruction

Leader - Col. Edward O'Connor Jr., Director of Operations,
6555th Aerospace Test Group

Deputy - Edgar Weber, Chief, Project Engineering Office,
Kennedy Space Center

Photo and TV Support Team

- * Collection
- * Processing
- * Enhancement

Leader - Daniel Germany, Deputy Manager,
Space Station Project Office,
Johnson Space Center

Deputy - Lt. Col. Thomas Redmond, Deputy Manager,
National Space Transportation System, JSC

Day-to-day operations of the task force will be supervised by
Vice Chairman Thompson.

- end -

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For Release:

Leon N. Perry
Headquarters, Washington, D.C.
(Phone: 202/453-1547)

March 6, 1986

RELEASE: 86-25

NASA TO PARTICIPATE IN HIGH ENERGY SOLAR PHYSICS PROGRAM

NASA has released an announcement of opportunity for U.S. scientists to participate in the High Energy Solar Physics program (HESP), sponsored by the Institute of Space and Astronautical Science (ISAS) of Japan. The HESP mission is planned for launch into low-Earth orbit in the early 1990s.

The goal of the HESP mission is to advance the understanding of high energy phenomena on the sun through X-ray and gamma ray observations taken by a carefully coordinated set of instruments carried on a spacecraft intended to be built and launched by ISAS. HESP will continue the systematic study of high energy solar processes started by the NASA Solar Maximum Mission and the ISAS Hinotori mission, both orbited in the early 1980s during the last epoch of maximum solar activity.

ISAS has invited U.S. scientists participation through NASA, under terms of the U.S.-Japan agreement on cooperation in research and development. This particular announcement of opportunity limits participation, both principal investigators and co-investigators, to scientists from U.S. institutions.

The solicitation by NASA for participation in the ISAS HESP mission is for a single scientific investigation from a small team of U.S. scientists who will analyze data derived from the HESP payload for the study and understanding of both energetic and quiet solar phenomena. The successful U.S. investigation team will be expected to help design and construct a soft X-ray telescope for the HESP payload, in conjunction with Japanese HESP scientists.

While ISAS anticipates final approval and funding for the HESP mission, such approval is not final as of the date of the announcement of opportunity. In the event HESP is not formally approved, no obligation is placed on the U.S. government to carry any selected investigation through to completion. Confirmation of any selections made for final development for flight will be contingent on conclusion of an agreement between NASA and ISAS, which will be negotiated during the coming year.

-end-

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Washington, D.C. 20546
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Kenneth C. Atchison
Headquarters, Washington, D.C.
(Phone: 202/453-8400)

For Release:

March 11, 1986

Carter Dove
Goddard Space Flight Center, Greenbelt, Md.
(Phone: 301/344-5566)

RELEASE: 86-26

LIQUID-FUELED ROCKET FLIGHT ANNIVERSARY TO BE MARKED

Sunday, March 16, 1986, marks the 60th anniversary of an historic scientific breakthrough -- the first liquid-fueled rocket flight.

The stage for this observance was set in 1926 when scientist-engineer Dr. Robert H. Goddard assembled a liquid-fueled rocket on his aunt's farm in Worcester, Mass.

The "launch control" team consisted of Goddard; Esther, his wife; Dr. P.M. Roope, a Clark University physics instructor; and Henry Sachs, a machinist and instrument maker at Clark.

Using a light, portable metal frame as the launch pad and ordinary gasoline as the propellant, Goddard opened the fuel valves on his 10-foot-high rocket and signaled Sachs to apply the blowtorch.

The results are in the record books. Gaining speeds up to 60 miles an hour, the rocket covered a span of 184 feet on its 2- or 3-second flight. Goddard's group had successfully launched the world's first liquid-fueled rocket flight. The event was a harbinger of things to come.

In commemoration of the liquid-fueled rocket flight anniversary, a full-scale replica of the rocket designed and built by Dr. Goddard will be launched from NASA's Goddard Space Flight Center, Greenbelt, Md., on March 16, 1986.

Following this launch at Goddard's Visitor Center, Washington area rocket enthusiasts will conduct their own rocket launches.

- end -

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(NOTE TO EDITORS: To cover the March 16 event, contact Dave Thomas at (301) 344-8955. Photos of Dr Goddard, a biographical videotape and photos of the early liquid-fueled rocket attempts are available, on request.)

NASA News

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Washington, D.C. 20546
AC 202-453-8400

For Release:

Dwayne C. Brown
Headquarters, Washington, D.C.
(Phone: 202/453-8400)

March 12, 1986

Pete Waller
Ames Research Center, Mountain View, Calif.
(Phone: 415/694-5091)

Release: 86-27

PRESIDENT AWARDS AMES CHIEF 1986 NATIONAL MEDAL OF SCIENCE

Bernard M. Oliver, Chief of the Search for Extraterrestrial Intelligence (SETI) program at NASA'S Ames Research Center, Mountain View, Calif., today received the National Medal of Science from President Reagan.

Dr. Oliver's citation commends him "for translating the most profound discoveries of physics and communication science into the electrical, radio, and computer systems which have improved our culture and the lives of all Americans."

"It's in recognition of a lifetime of accomplishment in science," added Mary Gant of the White House Science Office.

Nineteen other scientists also received the award--the nation's highest scientific honor.

The National Medal of Science was established by Congress in 1959 to honor up to twenty Americans each year for achievements in science. According to the enacting legislation, the President awards the medal based on "the total impact of an individual's work on the present state of the physical, biological, mathematical, engineering, behavioral, or social sciences."

Oliver has contributed to many important fields since receiving his doctorate in electrical engineering at the California Institute of Technology in 1940.

While working for Bell Telephone Laboratories from 1940 to 1952, Oliver helped establish standards for television transmission, worked on automatic radar tracking, and advocated pulse-code modulation for the telephone system, a method of transmission that was later adopted by the telephone company.

Oliver joined Hewlett-Packard Company as director and later vice-president of research and development; he was named director of the corporation in 1973.

While at Hewlett-Packard, Oliver developed the first hand-held calculator with scientific functions, which appeared on store shelves in 1972 with a price tag of \$395. His other innovations include the first programmable desk-top calculator with scientific functions.

After Oliver retired from Hewlett-Packard in 1983, NASA-Ames chose him to head its SETI program office. With antennas now used for radio astronomy and for Jet Propulsion Laboratory's Deep Space Network, the SETI program will scan the stars for radio signals that may be transmitted by intelligent extraterrestrial beings. Oliver has been closely involved with the program since its beginning in 1971.

-end-

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NASA News

National Aeronautics and
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For Release:

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Headquarters, Washington, D.C.
(Phone: 202/453-1547)

March 14, 1986

Randee Exler
Goddard Space Flight Center, Greenbelt, Md.
(Phone: 301/344-7277)

RELEASE: 86-28

NASA SCIENTIST AWARDED INTERNATIONAL ASTRONOMY MEDAL

Dr. Albert Boggess, Space Telescope project scientist for operations at NASA's Goddard Space Flight Center, Greenbelt, Md., has been named the co-recipient of the Herschel Medal, awarded by the Council of the Royal Astronomical Society of the United Kingdom.

Boggess was cited for his contribution to the success of the International Ultraviolet Explorer (IUE) satellite. He served as IUE project scientist from the development phase, through the first several years of operation, including the January 1978 launch of the spacecraft.

Professor R. Wilson, University of London, was the co-awardee of the Herschel Medal, which is awarded once every 3 years for exceptional contributions to observational astronomy.

The IUE is continuing a 10-month program to study Comet Halley's evolution as it approaches and then recedes from the sun. The research centers on the comet's physical and chemical properties.

The satellite maintains a quasi-geosynchronous orbit over the Atlantic Ocean, which allows it to be in contact with ground observation sites at Goddard and Villafranca, Spain, an observing site near Madrid.

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-2-

The IUE is a joint project of NASA, the European Space Agency and Britain's Science Research Council.

-end-

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March 18, 1986

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RELEASE: 86-29

NASA SATELLITE SUPPORTS COMET HALLEY ENCOUNTERS

NASA's International Ultraviolet Explorer (IUE) orbiting telescope conducted complementary observations of Comet Halley during the recent encounters of the comet by Soviet, European, and Japanese spacecraft.

The orbiting observatory, managed and operated by NASA's Goddard Space Flight Center, Greenbelt, Md., observed Halley as the Soviet Vega 2 spacecraft approached to within 5,000 miles of the comet on March 9. The previous day, the Japanese Suisei probe flew within 93,205 miles of the comet's nucleus. The IUE also viewed the comet as the European Space Agency's (ESA) Giotto spacecraft made its 310-mile pass of the nucleus, on March 13.

The recent observations of Halley by the ultraviolet telescope are part of a 10-month study of the comet conducted by IUE astronomers since September 1985. "Through the period of Halley's Comet observations by the IUE and many ground observatories, scientists hope to merge the in-situ information from this month's Halley encounters into the larger context of the comet's long-term behavior," said Dr. Yoji Kondo, Goddard's IUE project scientist.

The IUE is conducting a long-term study of the types and quantities of material ejected from the nucleus of the comet. From a vantage point high above the absorbing and obscuring effects of the Earth's atmosphere, the ultraviolet telescope measures the comet's water ejection rate and its carbon, sulfur, and oxygen content.

The telescope is also making periodic measurements of variation in the visual brightness of the comet. The IUE has shown that Halley's brightness can double in a few days.

George Sonneborn, IUE telescope operations manager for Computer Sciences Corp., Silver Spring, Md., believes that "the benefit of observing the comet from the IUE or ground observatories over a long period of time is that you get a 'movie' idea of how the comet changes, often from day-to-day. Earth-based and orbiting telescopes also provide a much wider-angle view of the comet at a given moment than do spacecraft passing the comet. Both these features should complement the 'snapshot' work of the probes by helping describe the stage of the comet's life that the probes see," said Sonneborn.

NASA had originally intended to provide orbiting observatory support to the international cometary probes through the Spartan-Halley and Astro-1 experiments, telescope payloads to be carried aloft by the shuttle. The experiments, however, were lost as a result of the Space Shuttle Challenger accident in January.

In an effort to find an acceptable alternative, Sonneborn and Michael Myslinski of the Bendix Corp., (Teeterborough, N.J.) and IUE Control Center Manager, developed a new viewing schedule to provide particularly heavy IUE coverage during the encounter days. The revised schedule included nearly 60 hours of viewing time. All observations were performed by Dr. Paul Feldman of Johns Hopkins University and Dr. Michael A'Hearn of the University of Maryland in collaboration with a European team of astronomers headed by Michel Festou of France's National Center for Space Research, with support from the IUE staff at Goddard.

The IUE telescope, which was launched in January 1978, has devoted more than 250 hours of its operation to watching Comet Halley -- more hours than the telescope has devoted to any of its previous targets in one year. Information from the IUE observations will be disseminated through the International Halley Watch, which is coordinating worldwide comet observation activities.

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March 19, 1985

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RELEASE NO: 86-30

NASA SCIENTISTS SEEK CAUSE OF EAST COAST CYCLONES

Scientists from NASA's Goddard Space Flight Center, Greenbelt, Md., plus 25 other federal and private laboratories have mounted the largest field experiment of its type, in an attempt to understand winter storms that annually wreak more than a billion dollars worth of havoc along the East Coast.

The experiment, named GALE (Genesis of Atlantic Lows Experiment) funded and led by the National Science Foundation, was conducted over a 2-month period that ended March 15.

Scientists are concentrating their efforts on the coastal regions of North and South Carolina where winter storms, commonly known as cyclones, develop rapidly and move northward. The storms often have been hard to predict for many reasons including inadequate understanding of their processes and poor observation especially over the ocean.

According to Dr. Louis Uccellini, of the Severe Storms Branch, Laboratory for Atmospheres at Goddard, "The goal is to obtain observations of these storms and ultimately develop a numerical storm model for the region that will enable researchers to predict the birth of storms, their subsequent movement and their intensities." The Severe Storms Branch, along with scientists from Goddard's Laboratory for Oceans, is studying specific storm phenomena as part of a national team of research groups attempting to develop a total picture of cyclone behavior. The national team includes some 200 scientists, engineers and technicians.

The NASA scientists are studying two areas of storm behavior which traditionally have been simulated by numerical models rather than by eyewitness accounts or direct measurements.

Uccellini's group is analyzing upper atmosphere conditions using temperature, moisture and wind sounding balloons launched every 3 hours from 40 sites administered by the National Oceanic and Atmospheric Administration (NOAA) throughout the Eastern third of the United States. The group also is collecting data from NASA's Nimbus 7 satellite, which carries an observing instrument called the Total Ozone Mapping System (TOMS). The TOMS provides a picture of the structure of the troposphere (ground level to 6 miles altitude) and the stratosphere (above 6 miles) as reflected by varying concentrations of ozone, one of the constituents of air.

Uccellini explained, "The data shows us how air masses are drawn into the troposphere from the stratosphere, possibly contributing to the development of cyclones. When the stratosphere descends in local spots the fast moving stratospheric air can rapidly tumble downward, setting up a circulation pattern that has great potential for developing a spin. But just how and when that happens is hard to predict and its interaction with lower tropospheric waves over the ocean is difficult to observe."

Scientists from the Laboratory for Oceans group, led by Dr. S. Harvey Melfi, associate chief for programs, are studying how conditions at sea level influence storm development. The group already has flown two of five scheduled airplane flights to chart how moisture rises into the atmosphere from the ocean between storms.

"During the lulls between storms, very cold air from the arctic sweeps in behind the outgoing low-pressure zones off the Carolinas and comes into contact with the warm coastal water. At those times, a tremendous amount of heat and moisture is released into the lowest layer of the atmosphere, setting the stage for rapid development of another storm," Melfi stated. "We want to know how the moisture transfer takes place, and why some cyclones suddenly develop very quickly and begin dumping snow while others fizzle out," he concluded.

To study the moisture transfer into the atmosphere, flights are conducted over the ocean storm region in a four-engine Electra from NASA's Wallops Flight Facility on Virginia's Eastern Shore. On board is a combined laser/telescope called Lidar which detects salt spray and aerosols rising from the ocean into the air. As the laser is fired over the sea surface, the rising salt and dust particles are illuminated and can be observed by the telescope, providing measurements of the rising moisture and also its convection patterns.

Data on moisture in the atmosphere also is being collected by NASA's high-altitude ER-2 aircraft carrying microwave radiometers able to detect water vapor and cloud liquid water content. The ER-2 airplane is managed by NASA's Ames Research Center, Mountain View, Calif.

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March 18, 1986

Release: 86-31

NASA AND JAPAN AGREE ON STATION HARDWARE FOR PRELIMINARY DESIGN

The National Aeronautics and Space Administration and the Science and Technology Agency of Japan today announced they have reached agreement on hardware elements that Japan will carry into the next phase of the Space Station definition and preliminary design study (Phase B).

The agreement calls for Japan to conduct preliminary design activities on an attached multipurpose research and development laboratory for the remainder of the Phase B period which extends through January 1987.

The agreement, signed by NASA Acting Administrator Dr. William R. Graham and Japan Minister of State for Science and Technology Yohei Kono, is a significant step in narrowing the function and content of hardware elements of the Space Station that could be provided by international partners.

The Japanese hardware includes a pressurized module that will provide shirtsleeve work space for station crews, an exposed work deck, a scientific/equipment airlock, a local remote manipulator arm and an experiment logistics module. The multipurpose laboratory will accommodate general scientific and technology development research, including microgravity research, as well as the control panels for operating the Space Station's mobile remote manipulator system and payloads attached to the station.

The agreement only covers the remainder of the Phase B period and does not obligate Japan to develop this hardware. The undertaking of a cooperative program to cover development of the hardware will be subject to successful completion of Phase B activities, to the satisfactory negotiation of an arrangement for cooperation in the development, operation and use of the Space Station and to the availability of funds.

-more-

NASA expects to complete the definition portion of the Phase B effort in the next few weeks, resulting in the selection of a baseline configuration for the Space Station, which will guide preliminary design activities for the remainder of the Phase B program. Development is scheduled to begin in mid 1987, leading toward the establishment of a permanently manned Space Station in the early 1990s.

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March 19, 1986

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RELEASE: 86-32

NASA SCHEDULES FIVE EXPENDABLE LAUNCHES FOR 1986

Five satellites will be placed in Earth orbit by NASA in 1986 using Delta and Atlas Centaur rockets. The launches include two Geosynchronous Operational Environmental Satellites (GOES), two Fleet Satellite Communication (FLTSATCOM) satellites and one Department of Defense mission.

The GOES satellites for the National Oceanic and Atmospheric Administration (NOAA) are an improved version of geostationary meteorological spacecraft providing day and night pictures as well as vertical temperature and moisture data in the atmosphere for use in weather forecasting. They also will collect and relay data from remote automated facilities including ocean buoys, rain gauges, river and tide gauges and automated weather-observing facilities. In addition, the satellites detect solar activity that impacts radio transmissions among other environmental effects.

The FLTSATCOM satellites are a second generation series of geostationary communications spacecraft to be shared by the Navy, Air Force and other entities within the Department of Defense, including the Strategic Air Command and the Presidential Command Network. They provide secure communications between land-based facilities and ships, submarines and aircraft. The Navy is the lead agency for the FLTSATCOM series.

Delta 180 will launch a mission for the Department of Defense which will support the research and development effort for the Strategic Defense Initiative.

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Delta rockets are launched under the management of a joint NASA/McDonnell Douglas Astronautics launch team. Atlas Centaurs (AC) are managed by a joint NASA/General Dynamics Convair launch team.

SCHEDULE OF EXPENDABLE LAUNCHES FROM CAPE CANAVERAL

May 1	Delta 178	Complex 17	Pad A	GOES-G
May 22	AC-66	Complex 36	Pad B	FLTSATCOM-F
Aug. 14	Delta 180	Complex 17	Pad B	DOD
Oct. 9	Delta 179	Complex 17	Pad A	GOES-H
Nov. 6	AC-67	Complex 36	Pad B	FLTSATCOM-G

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March 21, 1986

Release: 86-33

NASA AGREES TO CANADIAN SPACE STATION HARDWARE PROPOSAL

The National Aeronautics and Space Administration has agreed to a proposal by the Ministry of State for Science and Technology of Canada to perform preliminary design of a Mobile Servicing Center during the remaining phase of the Space Station definition and preliminary design study (Phase B).

Canadian Prime Minister Brian Mulroney announced Canada's decision to proceed with Space Station participation March 18 during a visit to Washington, D.C. to meet with President Reagan.

The Mobile Servicing Center would be a multi-purpose structure equipped with manipulator arms that would be used to help assemble and maintain the Space Station, as well as help upkeep instruments and experiments mounted on the Station's framework.

The agreement between NASA Acting Administrator Dr. William Graham and Canadian Minister of State for Science and Technology Mr. Frank Oberle marks an important milestone in the process of defining the function and content of hardware for the Space Station that could be provided by international partners.

The Mobile Servicing Center would consist of a base structure with accommodations for payloads, orbital replacement units, utilities and thermal control. Included with this structure would be the Space Station Remote Manipulator System, end-effectors and servicing tools, and special-purpose dextrous manipulators. As an adjunct to the design of a Mobile Servicing Center, Canada also will perform preliminary design on a fixed servicing site which could be used for working on attached payloads and for storing the spare parts carried on the Mobile Servicing Center.

NASA is conducting preliminary design of hardware for servicing sites on the Space Station. NASA is also conducting preliminary design of a flight telerobotic system which employ a dextrous robotic device for working on spacecraft brought to the Station, or for in-situ servicing, repair and refurbishment of remote spacecraft when used as the "smart front-end" of an Orbital Maneuvering System.

This agreement covers design work during the remainder of the Phase B period, which extends through January 1987. A formal decision by Canada to proceed with the development, operation and utilization of the Space Station will be subject to successful completion of Phase B activities, to the satisfactory negotiation of an arrangement for cooperation, and to the availability of funds.

NASA expects to complete the definition portion of the Phase B effort in the next few weeks. This will lead to the selection of a baseline configuration for the permanently manned Space Station, which will guide preliminary design activities for the remainder of the Phase B program. Space Station development is scheduled to begin in mid-1987 and lead to an initial orbiting capability by 1994.

- end -

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March 25, 1986

Jim Doyle
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RELEASE: 86-34

MARS OBSERVER MISSION CONTRACTORS SELECTED FOR NEGOTIATION

NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., has selected the RCA Corp., Princeton, N.J., and Orbital Sciences Corp. (OSC), Vienna, Va., for negotiations leading to the award of contracts to build a spacecraft and upper stage booster, respectively, for the Mars Observer Mission scheduled for launch in August 1990.

Negotiations with RCA for the spacecraft will be conducted by JPL. Negotiations with OSC for the upper stage will be conducted by the Marshall Space Flight Center, Huntsville, Ala.

In view of a bid protest filed with the General Accounting Office, contracts will not be awarded nor will proposed contract values be announced until the protest is resolved.

The basic contracts would extend through February 1991 for the upper stage booster, and through September 1993 for the spacecraft development and flight operations.

The spacecraft contract will include an option provision for three additional spacecraft buses, and the upper stage contract will include options for three additional stages.

The Mars Observer will study the climate of Mars, its atmosphere and surface using eight science instruments while in orbit around the planet during a full Martian year (687 Earth days).

The Mars Observer is the first in a series of proposed planetary observer programs using existing technology and spacecraft designs to provide economical scientific investigations of Venus, Mars, the moon and near-Earth asteroids.

Fixed-price contracts with incentive provisions are planned for both the spacecraft and upper stage development. Other bidders included Hughes Aircraft Co., El Segundo, Calif. and Ford Aerospace and Communications Corp., Palo Alto, Calif.

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April 1, 1986

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Shelley Canright
Langley Research Center, Hampton, Va.
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RELEASE NO: 86-35

STUDENT SHUTTLE EXPERIMENT GETS SECOND CHANCE TO FLY

A student comet experiment that was to have flown on NASA's Space Shuttle last month will get a second chance to observe Comet Halley from a high-flying NASA aircraft in April.

The comet photography experiment, "CAN DO," was developed by students, parents and teachers of the Charleston County School District in Charleston, S.C., and advisers from NASA, the National Geographic Society and the Medical University of South Carolina. It was scheduled to fly on the Space Shuttle Columbia on March 6 as part of the Astro-1 payload devoted to the study of Comet Halley. The experiment canister for CAN DO and other experiments developed by the school district was originally donated by NASA's Langley Research Center, Hampton, Va.

Following the Challenger accident, CAN DO experiment organizers received permission to fly their experiment on NASA's Kuiper Airborne Observatory aircraft. The flying observatory, a converted C-141, is scheduled to make several high-altitude flights over New Zealand between April 5-24. Comet Halley is most visible from the southern hemisphere.

Students from intermediate and high schools in the United States and several foreign countries planned to participate in the CAN DO experiment by photographing Halley from the ground and comparing their comet pictures to those taken from the Space Shuttle. With the granting of permission to fly the experiment on the Kuiper Airborne Observatory, "schools again have the opportunity to participate in the historic passing of Comet Halley," said Shelley Canright, educational programs specialist and organizer of the experiment at Langley.

Curricula that had been designed around the Shuttle experiment has been adapted for the flight of CAN DO aboard the airborne telescope facility.

Niki Wenger, a finalist in NASA's Teacher-in-Space program, will operate the experiment on at least two flights of the observatory. She will be accompanied by CAN DO mechanical engineer Tom O'Brien, a computer specialist at the Medical University of South Carolina who helped design the experiment and adapted the system to operate on the Kuiper Observatory aircraft.

Wenger, a West Virginia teacher who contributed to the educational program surrounding the planned CAN DO flight on the Shuttle, said one of the most important lessons students can learn from the reconfiguration of the experiment "is that when Plan A fails, you don't give up. You go to Plan B."

CAN DO consists of three specially adapted 35-millimeter Nikon cameras provided by the National Geographic Society. Special high-speed Kodak film will be used to take approximately 1,200 ultraviolet, infrared and visible images of the comet.

After the flight of CAN DO, education specialists at Langley will design instructional packets for teaching junior high and high school students how to scientifically interpret their own photos taken from the ground and compare them to those taken by the CAN DO experiment.

According to experiment organizers, students participating in the CAN DO "Ground Research Teams" have an opportunity to contribute to professional astronomers' study of Comet Halley. Most large observatory telescopes are not designed to view large objects such as the tail of a comet, and their ability to resolve fine detail in small regions of the comet tail can be enhanced by the much wider overall view that can be acquired through a standard camera lens. The success of comet studies made from any ground-based observatory is dependent on weather, and gaps in coverage can often be filled in by amateur efforts when weather obstructs the view from observatories.

Students and teachers are encouraged to participate in the experiment by joining or forming a "Comet Halley Ground Research Team" to photograph and study the comet, Canright said. Students also are invited to enter their photos of the comet in a contest from which the best pictures will be chosen for display at NASA facilities across the country and at the National Geographic Society's Explorers Hall in Washington, D.C.

For information on how to participate in the experiment, students and teachers may write to:

Comet Halley Ground Research Team
Mail Stop 154
NASA Langley Research Center
Hampton, VA 23665.

Participants will be provided with a booklet describing the equipment needed, directions for photographing the comet and instructions on how to analyze their results.

- end -

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March 28, 1986

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Marshall Space Flight Center, Huntsville, Ala.
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RELEASE NO: 86-36

KINGSBURY TO HEAD NASA SOLID ROCKET MOTOR TEAM

James E. Kingsbury, director of the Science and Engineering Directorate at NASA's Marshall Space Flight Center, Huntsville, Ala., will initially manage an ad hoc group that will requalify the motor of the Space Shuttle's solid rocket booster.

The Solid Rocket Motor Design Team will recommend and overview the implementation of a plan to requalify the motor for flight that will "include every aspect of getting ready to fly again," said Marshall Director Dr. William R. Lucas.

The purview of the team, according to Lucas, will include "the generation of design concepts, analysis of the design, planning of test programs and analyses of results, any other initiatives necessary to certify flight readiness and the development of launch commit criteria."

Gerald W. Smith, deputy associate director for engineering in Marshall's Science and Engineering Directorate, was named deputy manager of the team. Spacelab Program Office Manager John W. Thomas will eventually replace Kingsbury as manager of the Solid Rocket Motor Design Team when Thomas completes his current assignment as a member of NASA's 51-L Data and Design Analysis Task Force. That group is currently supporting the Presidential Commission on the Challenger accident investigation.

The formation of the solid rocket motor team was announced March 23 by Richard H. Truly, associate administrator for space flight, NASA Headquarters, Washington, D.C.

The activities of the team will be coordinated through Marshall's Solid Rocket Booster Project Office with the solid rocket motor contractor, Morton Thiokol, Inc., Brigham City, Utah. The team will draw on members of various organizations at Marshall, plus members of other NASA centers and aerospace contractors.

Kingsbury has been with Marshall and its predecessor organizations since 1951. He was directly involved in the design and development of the Redstone, Jupiter, Juno, Pershing and Saturn class launch vehicles. He has served in various technical and management positions, including chief of the Materials Division during the time of the Apollo 11 lunar landing and chief engineer for the mechanical systems in the development of Skylab.

He has held his current position as director of Science and Engineering since 1979, and will retain that position while heading the Solid Rocket Motor Design Team.

-end-

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April 2, 1986

Jim Ball
Kennedy Space Center, Florida
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RELEASE: 86-37

DESTACKING OF 61-G ELEMENTS AND MODIFICATIONS TO ORBITERS PLANNED

Destacking of the solid rocket motors for use on Space Shuttle mission 61-G, launch of the Galileo spacecraft to Jupiter, is scheduled to begin early this month as a data-gathering activity in support of the Challenger accident investigation.

The principal objective of the destacking exercise is to gather information to assess the preflight conditions in and around the vicinity of solid rocket motor field joints. Of primary interest will be the condition of the field joint "O" rings.

Inspections during destacking also will focus on examination of the putty used in the joints and on correlating rocket motor case ovality, or "roundness," with any assembly damage.

Assessments also will be made on the degree of clevis gap-opening resulting from stacking and assembly and the degree of propellant slumping that occurs as a result of vertical stacking.

Any relevant data from the destacking inspections that may be useful in the investigation of the Challenger accident will be assembled by the NASA 51-L Data and Design Analysis Task Force and provided to the Presidential Commission on the Space Shuttle Challenger Accident.

Operations to remove the external tank from the 61-G stack are underway this week. Orbiter Discovery will be temporarily moved out of the Vehicle Assembly Building storage bay while the 61-G external tank is placed in a storage cell.

In parallel with the 61-G destacking operations, the KSC shuttle processing team will proceed with approved modifications on the orbiters.

This work includes major modifications to the orbiter Discovery to equip the ship for missions that will use the Centaur upper-stage, structural reinforcement of the orbiter's wings, and installation of special instrumentation for future launches from the Vandenberg Air Force Base in California.

Other modifications planned for the orbiters Discovery, Columbia and Atlantis, include previously approved modifications and equipment upgrades that were deferred until time was available.

-end-

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For Release:
April 2, 1986

RELEASE: 86-38

ASTRONAUT MEMORIAL TO BE BUILT

NASA and the Astronauts Memorial Foundation, Inc. today announced plans to build a memorial at the Kennedy Space Center, Fla., dedicated to astronauts who have lost their lives while flying, training or awaiting assignment to fly for the space agency.

NASA will provide a site for the memorial at the Kennedy Space Center, while the foundation will raise funds for the design, construction and perpetual care of the memorial. U.S. Sen. Jake Garn and U.S. Rep. Bill Nelson, both of whom have flown on the Space Shuttle, are co-chairing national fundraising efforts for the private, non-profit foundation, based in Cape Canaveral, Fla.

Once the memorial is completed, education will become the focus of the foundation's efforts, according to the group's organizers. A scholarship fund will be established to support students pursuing careers in the fields of teaching, engineering and science.

The memorial will honor: the Space Shuttle Challenger crew, including Francis (Dick) Scobee, Michael Smith, Judith Resnik, Ronald McNair, Ellison Onizuka, Christa McAuliffe and Gregory Jarvis; the Apollo crew who died when a fire swept their spacecraft during a launch simulation in 1967, including Virgil (Gus) Grissom, Edward H. White II and Roger Chaffee; Gemini IX astronauts Charles Bassett and Elliott See, who were killed in a crash of their T-38 trainer aircraft in 1966; Theodore Freeman, who died in a T-38 accident in 1964; Clifton Williams, who also died in a T-38 accident in 1967, and Edward Givens, who was killed in an automobile accident in 1967.

- more -

Contributions to the Astronauts Memorial Foundation, Inc.,
may be addressed to:

Astro Memorial Foundation Inc.

P.O. Box 628003

Orlando, FL

32862-8003

-end-

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NASA News

National Aeronautics and
Space Administration

Washington, D.C. 20546
AC 202-453-8400

For Release:

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Headquarters, Washington, D.C.
(Phone: 202/453-8536)

April 4, 1986

Jim Ball
Kennedy Space Center, Florida
(Phone: 305/867-2468)

RELEASE: 86-40

ORBITER COLUMBIA ASSIGNED TO SUPPORT VANDENBERG SITE VALIDATION

NASA plans to ferry the orbiter Columbia to Vandenberg Air Force Base, Calif., in mid-July to support launch site validation testing in preparation for the first west coast Space Shuttle launch.

Presently at the Kennedy Space Center, Fla., undergoing postflight servicing and a series of modifications, Columbia is expected to remain at the California launch site through early November.

Testing will closely parallel those performed at Kennedy Space Center prior to Columbia's first flight on the maiden Space Shuttle mission in April 1981.

Columbia will be flown to Vandenberg atop the modified Boeing 747 Shuttle Carrier Aircraft. Initial processing to remove ferry flight equipment and ready the ship for vehicle stacking will be performed at the Orbiter Maintenance and Checkout Facility.

Columbia then will be moved to the launch pad and mated with a set of solid rocket boosters and an external tank for integrated vehicle testing including the loading of cryogenic propellants in a "wet" countdown demonstration test.

No flight readiness firing is planned during this phase of Vandenberg site testing, but such a test firing is baselined as part of the first launch flow.

- more -

Processing on Columbia at KSC over the next 3 months will include installation of main engines, auxiliary power units and orbital maneuvering system pods in parallel with structural inspections, approved modifications and ferry flight preparation.

The decision to assign Columbia to near-term Vandenberg site validation testing will support extensive modifications of Discovery at KSC, baselined to fly the west coast missions.

Discovery will remain at KSC over the summer undergoing modifications to equip it for Centaur missions, completing planned wing structural strengthening and installation of additional test instrumentation desired for the initial Vandenberg launches.

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April 9, 1986

RELEASE: 86-43

SECOND REPORT ISSUED ON SCIENTIFIC USES OF SPACE STATION

NASA's Task Force on the Scientific Uses of the Space Station has released its second major report, calling for the need to generate general guidelines for the design, development, operation and future evolution of the Space Station as a way of ensuring its effectiveness as a research facility.

Established in March 1984 and chaired by Stanford University Professor Peter M. Banks, the task force was formed to assist NASA in planning for the scientific utility of the Space Station. The task force held its second summer study Aug. 19-23 last year at Stanford and compiled its report based on recommendations from its members, invited participants from the scientific community, international observers and NASA.

The 1985 study focused on a long-range view of the Space Station within the context of research in space, with particular attention paid to ways in which the resources and capabilities of a manned Space Station could be used to the best scientific advantage.

The report points out that while space-based scientific progress has been slower than desired because of short time in orbit, rigid timelines and long periods between flights, the Space Station has the potential to overcome these difficulties. The report states that "with the proper organization, facilities and resources, the task force can see the possibility that the Space Station laboratories can become an active, vital part of the U.S. and international science establishment, competing directly and effectively with other large, user-oriented facilities for its funds and share of recognized achievement. The possibility has excited the task force and led us to actively support the Space Station project."

Among its major recommendations and conclusions:

- * Space Station facilities must be operated with the goal of producing outstanding scientific results.

As is the case for other large, national research facilities, the Space Station will be judged with respect to cost and research productivity. For the Space Station to be effective, it must demonstrate cost-effective operations and high-caliber technical results of general interest to science.

- * There is a need for well-equipped, permanently manned laboratories that can support a broad range of fundamental research in space.

The report states the mode of scientific endeavor for the Space Station must emulate the adaptive science methodology used in terrestrial laboratories, including an operations philosophy that permits use of high-quality, industrial-grade hardware with maximum flexibility in adjusting experimental apparatus and procedure on-orbit without extensive ground verification and without lengthy and expensive flight qualification.

The task force recommends "telescience," the ability to conduct research remotely, as a way of emulating the advantages of physical presence at a remote laboratory.

Other recommendations include: a review of safety standards to achieve a reasonable state of personal and systems security; a crew size of 10 to permit station operations and science; and development of a "space mail" system capable of delivering small samples of perishable and fragile materials to ground laboratories within 18 hours of experiment termination.

- * Attached payloads are an important part of the core Space Station.

The task force recommends that NASA develop a more productive plan for converting Earth, sun, and planetary observation experiments developed for Spacelab into attached payloads for the core Space Station.

- * Free-flying platforms are essential for conducting many important scientific endeavors for the Space Station era.

Based on the stated needs of the scientific community, the task force sees a requirement for several platforms operating in different orbits as well as for small, upgraded platforms based on systems such as the European Space Agency's Eureka and NASA's Spartan.

- * NASA should enhance the manned research activities in the pre-initial orbit configuration period using Spacelabs and other attached payloads on the Space Shuttle.

The task force points out the urgent need for experience in conducting manned science research programs in space prior to initiation of Space Station activities. One way of obtaining the experience, says the report, would be the development of a low-cost, enhanced-duration capability for the Space Shuttle which could extend time on-orbit to 16 days.

- * Development of a man-tended mode of scientific activity aboard a Space Station would be of little value except to the extent that it would support somewhat longer experiment times than are available with the Space Shuttle.

The task force points out the need for a truly long-term, manned capability. "It is possible that some experiments could be automated to permit operations in the absence of the scientific crew," said the report. "However, the spectrum of experiments that could be undertaken in this mode is greatly restricted owing to practical considerations of safety, sample characterization and the intrinsic costs of developing such capabilities when little practical experience along these lines has occurred in ground-based laboratories."

- * It is essential that NASA look ahead to the activities that are anticipated over the 25-to-30-year lifespan of the core facility and its associated elements.

For the Space Station to be useful for future scientific endeavors, says the report, it must adapt to the needs of its scientific clientele by incorporating design features that permit evolution of the facilities at reasonable cost.

- * The Space Station will facilitate development of a new type of research termed "science in space."

Emphasis of NASA space research to date has been on outward-looking remote sensing equipment. Space Station will allow the conduct of other types of experiments enabled by low acceleration levels expected for the research laboratories.

- * The science operations of the Space Station should be separated from the operational management of the overall facilities.

The task force recommends setting up science operations as one of the "vice presidents" of the overall management structure, and suggests a science management infrastructure be established to set long-range scientific goals, distribute information about flight opportunities and evaluate and select flight experiments with varying degrees of peer evaluation.

- * NASA must be prepared to change many of its nationally-oriented selection, funding and management procedures because of the important hardware and scientific contributions that will be made by international partners.

Agreements must be explored in the near future on a list of international topics including the selection of science projects, resource allocation, science collaborations, science management and funding. Said the report, "NASA's Office of Space Science and Applications should take a leading role in defining a suitable international science management structure."

The task force report on Scientific Uses of the Space Station is available in the newsrooms at NASA Headquarters, Washington, D.C.; Goddard Space Flight Center, Greenbelt, Md.; Lewis Research Center, Cleveland, Ohio; Johnson Space Center, Houston, Texas; Kennedy Space Center, Fla.; and Marshall Space Flight Center, Huntsville, Ala.

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April 15, 1986

RELEASE NO: 86-45

THOMPSON NAMED NASA SAFETY DIRECTOR

Robert H. Thompson has been appointed Director of the Safety Division, Office of the Chief Engineer, NASA Headquarters, Washington, D.C. In this position he is responsible for management of NASA-wide safety matters and serves as the senior safety advisor to agency program, institutional and functional managers.

Before coming to NASA, Thompson was Chief Engineer in the Safety Directorate at the Western Space and Missile Center, Vandenberg Air Force Base, Calif., since August 1983. He began his career in 1960 as an aeronautical engineer at the Naval Missile Center, Pt. Mugu, Calif. He held various positions with the Navy and Air Force until 1972 when he became Chief of the Safety Analysis Division (Armament Division) at Eglin Air Force Base, Fla. In 1977 he was appointed Director of Range Support for the Armament Division at Eglin.

Thompson received a B.S. in aeronautical engineering from Virginia Polytechnic Institute in 1960 and an M.S. in systems management from the University of Southern California in 1969. He is a graduate of the DOD Executive Seminar and has completed numerous other management and safety courses. He is a Registered Professional Safety Engineer.

Thompson is a member of the American Institute of Aeronautics and Astronautics, the National Society of Professional Engineers, the California Society of Professional Engineers, the Air Force Association, the Systems Safety Society and the American Defense Preparedness Association.

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April 19, 1986

RELEASE NO: 86-46

CREW CABIN RECOVERY OPERATIONS COMPLETED

Rear Admiral Richard H. Truly, Chairman of the STS 51-L Data and Design Analysis Task Force, has announced that recovery operations centered around the retrieval of the Space Shuttle Challenger crew cabin have been completed.

The effort began on March 7 when divers assigned to the Eastern Space and Missile Center first located the crew compartment. The Navy's USS Preserver was dispatched to the area and began diving on March 8 and has been the primary vessel involved in the recovery operations. USS Preserver divers removed the majority of the crew cabin debris from the ocean floor between March 8 and April 4. Following a period of heavy seas, high winds and reduced underwater visibility, a commercial scallop boat, Big Foot, retrieved debris covered by silt during the foul weather.

The Edwin Link and the submersible Sea Link I conducted a visual and video scan of the area on April 7 locating debris which Coast Guard divers from the G.W. Pierce recovered between April 8 and April 10.

On April 12, the Independence, with the submersible Deep Drone, initiated a video survey of the area. As a result of this survey, divers from the G.W. Pierce and the USS Opportune were able to complete the recovery operations on April 18.

Remains of each of the seven Space Shuttle Challenger crewmembers have been recovered. Final forensic work and future planning in accordance with family desires is expected to be completed within the next several days and will be announced when appropriate.

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Truly stated, "This long and arduous at-sea operation, conducted under difficult conditions during both daylight and darkness, reflects great credit upon the leadership of the salvage and recovery team and particularly those individuals who were involved in the diving operation, both on the deck and below the surface. I know that I can speak for the families and all of NASA in conveying our admiration for this job well done."

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April 21, 1986

John Lawrence
Johnson Space Center, Houston, Texas
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RELEASE: 86-48

ASTRONAUT OVERMYER RETIRES

Astronaut Robert F. Overmyer (Col., USMC) will leave NASA and retire from the Marine Corps effective June 1. Overmyer has not announced his post-retirement plans.

Overmyer piloted Columbia on the fifth Space Shuttle mission in November 1982 and was commander of Challenger's April 1985 flight, mission 51-B, the second flight of Spacelab.

Since joining NASA in September 1969, Overmyer's duties have included engineering development of Skylab, support crew and capsule communicator (capcom) for Apollo 17, support crew and Moscow capcom for the Apollo-Soyuz Test Project, deputy chief of Johnson Space Center's Aircraft Operations Office, deputy vehicle manager for final manufacturing of Columbia at Kennedy Space Center, chief T-38 chase pilot for the Approach and Landing Program, engineering development duties on the Space Station project, and member of the task force supporting the investigation of the Challenger accident.

Overmyer was awarded the Meritorious Service Medal for duties as chase pilot, the Distinguished Flying Cross for STS-5 and the NASA Space Flight Medal with cluster. He has compiled more than 6,500 hours of flight in 28 different aircraft.

As an astronaut, Overmyer spent over 290 hours in space, including 191 orbits of the Earth and traveling more than 4.35 million miles.

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April 25, 1986

RELEASE NO: 86-49

COMMERCIAL DEVELOPMENT CENTER CANDIDATES NAMED

The National Aeronautics and Space Administration has announced the 25 teams which have submitted proposals to its second solicitation to establish Centers for the Commercial Development of Space.

The objective of these centers is to stimulate high technology research in the microgravity environment of space. This research eventually will lead to the development of new products which either have commercial potential or contribute to possible commercial ventures.

The research areas proposed include semiconductor crystal growth, remote sensing, communication technology, biotechnology and space services.

NASA's Office of Commercial Programs, Washington, D.C., received proposals from industry/university consortiums in response to a program solicitation.

Proposals were received from the following lead institutions:

Florida Institute of Technology
Research & Engineering
Melbourne, Fla.

Clarkson University
Potsdam, N.Y.

Southwest Biotechnology Center
Albuquerque, N.M.

University of Massachusetts
Polymer Research Institute,
Amherst, Mass.

-more-

University of Wisconsin
Madison, Wis.

Stanford University
Stanford, Calif.

Worcester Polytechnic Institute
Center for Fire Safety Studies
Worcester, Mass.

Midwest Research Institute
Kansas City, Mo.

Texas A&M University
College Station, Texas

Aeroconsortium
Wrightwood, Calif.

Tulane University
New Orleans, La.

University of New Mexico
Center of High Technology Materials
Albuquerque, N.M.

Weber State College
Center for Aerospace Technology
Ogden, Utah

Georgia Institute of Technology
Atlanta, Ga.

University of Houston
Houston, Texas

Southeastern Massachusetts University
North Dartmouth, Mass.

Ohio State University
Columbus, Ohio

Case Western Reserve University
Cleveland, Ohio

University of New Mexico
Technology Application Center
Albuquerque, N.M.

Southeast Florida Educational Consortium
Miami, Fla.

Woods Hole Oceanographic Institution
Woods Hole, Mass.

Massachusetts Institute of Technology
Cambridge, Mass.

Southwest Research Institute
San Antonio, Texas

Center for Innovative Technology
Herndon, Va.

Clemson University
Clemson, S.C.

The proposals currently are being reviewed by a panel of technical, managerial and financial experts. The review is expected to take 45-60 days.

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April 25 ,1986

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RELEASE: 86-51

ARTIFICIAL CLOUDS TO BE VISIBLE AT DAWN ALONG EAST COAST

Two rocketborne scientific experiments, planned to create artificial clouds at high altitudes, are scheduled for launch during early May from NASA's Wallops Flight Facility, Wallops Island, Va. The objective of the launches is to investigate Nobel prize winner Dr. Hannes Alfven's proposed Critical Velocity Effect Theory, which has been used to explain details in the early formation of the solar system.

In 1954, Alfven proposed that if an element in a nearly neutral plasma became ionized (electrically charged) when it attained a flow velocity that matched its ionization potential, several facets of the structure of the solar system could be explained, including differing chemical compositions of the planets and the regularity of their orbits. Alfven received the 1970 Nobel Prize for Physics, for his work in plasma physics and its application to astrophysics.

Although Alfven's critical velocity effect has been studied in the laboratory, the phenomena must be investigated in a space plasma. Because plasma parameters in a space environment are different from those obtainable in the laboratory, doubt has existed whether the critical velocity effect would occur in space. For example, the absence of laboratory experiment plasma containing walls could drastically alter the process.

Two large suborbital rockets -- a Black Brant X and a Taurus-Nike-Tomahawk -- are scheduled for pre-dawn launch, approximately 10 minutes apart between May 5 and May 20. The artificial clouds will be visible, weather permitting, along the entire East Coast from Canada to Florida and as far west as Ohio. The experiments are conducted at dawn when the Earth's surface is in darkness, but with sunlight at the experiment altitude, the cloud chemicals are ionized, making them visible to the naked eye.

The three-stage Black Brant X rocket is 56 feet long, 18 inches in diameter. The 17-ft. payload contains two canisters of barium. One canister will be ejected on ascent and the other on descent near the apogee altitude of 267 miles. The barium will appear as whitish yellow with a possible bluish green tail which will turn green or violet and be visible for about 15 minutes. The payload's main section will be recovered from the Atlantic Ocean, about 300 mi offshore.

The Taurus-Nike-Tomahawk, also a three-stage rocket, is 42 ft. long, 23 in. in diameter. Its payload contains strontium which will appear as a deep blue ball that will grow rapidly in size and remain visible for about 15 minutes, before disappearing at sunrise. Like the Black Brant X, the Taurus-Nike-Tomahawk is a solid-propellant vehicle.

When the releases occur, ground observers using binoculars and more sophisticated video and camera instruments can determine whether the anticipated effect occurs. If successful, the cloud should split into two well-delineated jets of gas in the first few seconds.

Three primary ground observation sites, located at Duck Island, N.C.; Eastville, Va. (near Wallops); and near Cape May, N.J., will be staffed by the University of Alaska, Fairbanks, and the Max Planck Institute, Munich, West Germany. Additional observer locations include Los Alamos National Observatory, N.M.; Stanford Research Institute, Calif.; Millstone Hill Radar, Massachusetts Institute of Technology and two portable radars in the Bahamas.

R. Roy Torbert, University of Alabama, Huntsville, and University of California, San Diego, is principal investigator for the Black Brant X experiment. Dr. Eugene Westcott, University of Alaska, Geophysical Institute, is principal investigator for the Taurus-Nike-Tomahawk experiment.

Other university experimenters include Professors Gerhard Haerendel, Max Planck Institute for Extraterrestrial Physics, Munich; Michael Kelley, Cornell University, Ithaca, N.Y.; C.G. Falthammer, Royal Institute of Technology, Stockholm; Carl Howlett and Kay Baker, Utah State University and John Foster, Massachusetts Institute of Technology.

The experiments are part of NASA's sounding rocket program, which includes launching approximately 40 to 45 sounding rockets a year from various worldwide locations.

Wallops Flight Facility is managed by NASA's Goddard Space Flight Center, Greenbelt, Md. Project managers are Paul Buchanan for the Black Brant X experiment and Jay Brown for the Taurus-Nike-Tomahawk.

-end-

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April 25, 1986

RELEASE NO: 86-52

NASA RESPONDS TO NEW YORK TIMES

The National Aeronautics and Space Administration has issued the following response to the New York Times articles of April 23 and 24 alleging management problems of the space agency:

The two-article series deals with implications and draws conclusions which, in significant respects, do not accurately represent the way NASA is managed.

The primary focus of the articles is on audits and safety with particular emphasis on the Space Shuttle program, a uniquely technical and complex spaceflight system -- undertaken in an economical manner providing adequate testing to insure that safety was always the first consideration.

Some of the problems cited from the audits are related to activities several years ago and have been corrected or are being corrected. NASA has always considered audits to be a necessary management tool to be used in conjunction with other management processes. Furthermore, during the existence of NASA prior to and since the Inspector General Act, management has used its own internal audits to uncover and correct deficiencies and to strengthen internal controls. In addition, NASA has been responsive to external audit reports through tighter management.

Thus, the New York Times' articles are inaccurate in alleging that NASA disregards audit reports and neglects proper testing and safety procedures. The reporter takes various statements and phrases from audit reports out of context and gives a misleading impression of NASA's performance in managing its technical programs.

Attached is a discussion of issues raised by the articles.

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NASA RESPONSE TO NEW YORK TIMES SERIES OF APRIL 23-24, 1986

The NASA-industry-university team has put together an unrivaled 28-year achievement record through the dedication and competence of proven professionals. It is in this context that the Challenger tragedy and the New York Times allegations, many of which are misleading and taken out of context, should be assessed. These allegations, many 10 to 15 years old, are primarily based on NASA's own self-audits, for which corrective action has been taken or is in progress. Indeed, these audits, some 13,000 in number since 1978, represent one measure of the unique scope and complexity of the space program. Ninety-five percent of these audits were conducted by NASA's own team of in-house and associated Department of Defense auditors.

Internal and external audits of NASA programs have, from the beginning of the agency in 1958, been a valued element of the agency's management approach. NASA has an in-house audit organization of more than 100 people, most of whom are assigned to its field centers to examine in-house activities. Audit of contract activities is carried out by the Defense Contract Audit Agency (DCAA) at NASA's request with suggested areas of investigation. DCAA has on-site auditors assigned to NASA's largest centers. In addition, the General Accounting Office (GAO), at the request of Congress and at their own instigation, regularly conducts audits of the entire NASA program. As a result of the Inspector General Act of 1978, coverage of the audit program was broadened in both the technical and administrative areas. This act underscored again the complete independence of the Inspector General from NASA management. The IG office also reviews DCAA audit reports and refers problems to NASA management for appropriate action. The Federal Managers Fiscal Integrity Act of 1982, requiring federal agencies to look hard for waste, fraud and mismanagement, resulted in further increasing audit program coverage and called for significantly more participation by NASA line management.

NASA believes its audit organization, coverage and process is working effectively. Indeed, as stated, NASA management provides leads to its audit staff in addressing potential problems. A measure of the effectiveness of the agency audit program is indicated by the fact that during the period from FY 1978 through FY 1985 NASA management realized \$734.6 million in savings due to audits of NASA contracts and internal operations. An additional \$10.9 million in cost avoidances and \$3.8 million in cost recoveries were realized as a result of investigations during the period FY 1981 through FY 1985. This is a total of \$749.3 million in savings, cost avoidances and cost recoveries.

In fairness, it also should be noted that many of the audit reports deal with research and development projects -- projects which, at a point in time, must identify a highly-desirable, complex technical objective several years into the future.

The supporting budget and technical schedules must necessarily assume the timely development of new technologies and the assimilation of others which mature during the time of a project. This represents a very uncertain environment, characteristic of advancing the state of the art, and one in which problems of technical development, scheduling and budget estimating can reasonably be expected. In this context, cost increases are not at all unusual in the complex environment of research and development and NASA's record compares favorably with both industry and other federal laboratories.

The development of the Space Shuttle, a unique advance in technology, ran at an approximate 30-percent overrun rate from a budget estimate made in 1971, remarkable in view of the technical and economic uncertainties encountered in developing a totally new space transportation system. The 25- and 30-percent estimates are taken from GAO reports.

At the same time, it should be acknowledged that the agency often operated under tight fiscal constraints. These constraints necessarily caused changes in both operational and management approaches. This in turn causes short-term adjustments in both operational and budget schedules which can add to the long-term costs of a program due to the overall delay. Nevertheless, safety has always been a paramount concern of NASA.

The Space Shuttle flying today is not the configuration on which NASA based its budget estimates in 1971. Many of the features originally planned to reduce operational requirements had to be dropped due to cost or technical considerations and this, coupled with increased mission complexity and lower flight rates, has significantly affected the initial cost-per-flight targets.

The article alleges that NASA predicted that the cost of lifting Shuttle cargo into orbit would be \$100 a pound. "...the cost now is \$5,264 a pound for the total program and \$2,849 a pound for operations alone. Discounting for inflation, the corresponding rise is 9 to 19 times...." This comparison is factually incorrect and misleading. Cost per pound is really only a partial indicator of the Shuttle's utility, since many payloads are volume and not weight limited and the figure does not consider the value of many of the Shuttle payloads which simply cannot be launched on any other vehicle. The higher estimates appear to be based on the cost-per-flight figures of \$279 million and \$151 million mentioned earlier in the article which are projections for 1986 launches and a launch capability of 53,000 pounds. The original estimate of \$10.45 million per flight in 1971 dollars was based on the 12-year average operations cost and the Shuttle capability of 65,000 pounds, a maximum payload weight which is being approached in a step-by-step conservative manner. The resultant estimate would be about \$160 per pound. The current estimate on a comparable basis would indicate a cost per pound of \$615.

It is correct to say that the Shuttle was not equipped with the amount of hardware for test purposes that was available to the Apollo program. The result was a reduced capability for parallel testing and for testing separate components. The impact in some instances resulted in longer periods of testing than might otherwise have been required. However, when the test involved issues of systems performance or safety, time was taken to run the necessary tests. A significant example of taking additional time and incurring additional expenses to complete thorough testing in the interest of safety involved the tiles on the orbiter. Preparation for the initial launch was delayed several months to permit completion of "pull" testing and the necessary replacement of tiles.

In regard to the Tracking and Data Relay Satellite System (TDRSS) program, the basic objectives of financing through government-guaranteed loans were to maintain a balanced program of Research and Development within the available NASA budget and to utilize the capabilities of private industry to build and operate a system to provide service to NASA. These objectives were exhaustively discussed with the appropriate Congressional officials prior to the initiation of the program. The GAO testified prior to the award of the contract for TDRSS that "From a standpoint of net cost to the federal government, there is not a strong basis for concluding that either acquisition method, lease or purchase, is preferable to the other." Specific legislation was enacted by the Congress to authorize NASA to enter into the TDRSS contract. The \$1 billion alleged as waste was in fact attributable primarily to significant interest cost increases, with interest rates increasing from 7.5 percent to as high as 15.9 percent, and unavoidable delays in establishing operations.

In regard to the \$2.4 million of equipment alleged to have been misinventoried in 1983, this refers to the original acquisition costs of certain components of the ILLIAC computer system. This first supercomputer was a milestone in computer development but represented 1950s technology. By 1983 it was a totally obsolete, one-of-a-kind computer without a ready supply of spare parts to repair frequent system failures. The ILLIAC system was advertised to other federal agencies as excess computer equipment, and none expressed any interest. As a result, the system was dismantled and disposed of. At the time of disposal the system was worth little and certainly far less than the \$2.4 million quoted. Further retention of the ILLIAC would have created unnecessary costs beyond its residual value.

The article also alleges various violations of law and refers to unspecified "federal codes" which cannot be addressed without further identification. Most of the identifiable legal issues described individual misconduct as opposed to institutional. Such incidents are thoroughly investigated by NASA and the concerned individuals appropriately prosecuted or disciplined.

For example, the article correctly notes that the Director of the Lewis Research Center and a Marshall Space Flight Center official were prosecuted in federal court, resulting in a conviction in one case and a guilty plea in the other. In NASA's view, this is a clear indication that the internal NASA investigation process is working well.

In the final analysis, auditors will continue to call attention to NASA's technical and management problems. This is good and indicates the process is working effectively. The resolution of these problems will often involve disagreement on complex, technical matters; indeed, some of those may result from the limited technical backgrounds of the auditors. Audit reports often focus on problems and blur the overall perspective on the real condition of an audited activity. Indeed, the report citing problems with the external tank began with the statement, "NASA's management and administration of the external tank have generally been effective."

The Challenger tragedy makes us all painfully aware of the risks involved in working on the cutting edge of research and technology. NASA accepts this challenge and will continue to pursue an open and aggressive audit program in the conduct of the U.S. space program -- a vital national asset.

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April 25, 1986
6:00 p.m. EST

RELEASE 86-53

STATEMENT BY REAR ADMIRAL TRULY

With the upcoming transfer of the remains of the Space Shuttle crew early next week, the time is appropriate to share with the American public the efforts which have been expended and the status of NASA's search for the probable cause of their death.

Because NASA has not been able to ascertain the cause of death of the crew, I have felt that it has been inappropriate to comment prior to this time. The determination is a very difficult and time-consuming task. Three approaches to review of the evidence are being actively pursued: examination of the remains; direct examination of the wreckage; and analysis of photography and radar to determine forces imposed on the vehicle.

I had hoped that a careful and professional examination of the remains would provide the answer. The identification and examination of the remains was conducted by personnel from the Armed Forces Institute of Pathology. The examinations have not revealed any conclusive evidence about either the cause or time of death.

Further, the wreckage examination task is complicated by the amount of damage done at water impact. Whether or not a cabin rupture occurred prior to water impact has not yet been determined by a superficial examination of the recovered components. An in-depth analysis with significant testing of the wreckage is required and is being pursued.

NASA currently is concentrating its efforts on analysis to attempt to determine the forces imposed on the cabin during and after breakup. This requires careful enhancement of photography, review of the radar data and significant engineering calculations.

Extremely large forces were imposed on the vehicle as evidenced by the immediate breakup into many pieces. The determination of the magnitude and direction of these forces and their effect on the crew module is a lengthy process and is currently in work. Once these forces have been accurately determined, if in fact they can be, the structural analysts will attempt to estimate the effect on the structural and pressure integrity of the crew module. Once any conclusive results are obtained, the wreckage must then be examined to attempt to verify the results of the analysis.

All of this work is being vigorously and carefully pursued. Its results will be reported first to the families and then to the public.

-end-

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NASA News

National Aeronautics and
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Mark Hess
Headquarters, Washington, D.C.
(Phone: 202/453-1192)

For Release:

April 29, 1986

Mary Ann Peto
Lewis Research Center, Cleveland, Ohio
(Phone: 216/433-2902)

RELEASE NO: 86-55

NASA ANNOUNCES TERMINATION OF CONTRACT WITH TRW

NASA's Lewis Research Center, Cleveland, has announced the termination of one of the two Phase B Space Station electrical power system contracts. The contract being terminated, for the convenience of the government, is with TRW Federal Systems Division, Redondo Beach, Calif.

This action was taken after lengthy discussions with TRW in which TRW expressed its desire not to pursue preliminary design of the baselined hybrid (photovoltaic plus solar dynamic) power system. TRW, however, remains committed to the Space Station program and is currently a major contributor to the other three work packages.

Because all major procurements will be open competition, acquisition planning for the development phase of the Space Station program is unaffected by this action.

The Space Station program consists of four work packages managed by NASA's Johnson Space Center, Houston; Marshall Space Flight Center, Huntsville, Ala.; Goddard Space Flight Center, Greenbelt, Md.; and Lewis. All work package team members currently are completing concept definition for their respective elements and subsystems.

In addition to being the lead center for the Space Station electrical power system, Lewis is contributing in the areas of communications, auxiliary propulsion and thermal management.

-end-

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For Release:
May 9, 1986

RELEASE NO: 86-58

THOMAS ASSUMES RESPONSIBILITY FOR SRM REDESIGN

Statement by Rear Admiral Richard H. Truly, NASA Associate Administrator for Space Flight:

John W. Thomas, Spacelab Program Office Manager at the Marshall Space Flight Center, Huntsville, Ala., is assuming management responsibility for the Solid Rocket Motor (SRM) redesign team at the Marshall Space Flight Center effective May 12, 1986. Thomas' appointment to this position was previously announced in March when the team was established to recommend a program plan leading to a redesign of the SRM joint. In addition, an independent group of senior experts will be formed to oversee the motor redesign. This senior group will be involved in all phases of the program, will report to the Administrator of NASA, and will thoroughly review and integrate the findings and recommendations of the Presidential Commission on the Space Shuttle Challenger Accident.

The accident investigation has identified several deficiencies in the design of the solid rocket motor joint. The redesign team has begun to consider a number of design options as candidates for a final design, which will not be selected until the receipt and consideration of the Presidential Commission's final report and recommendations. The team is now proceeding with the development of an intensive test program to provide the necessary data to eventually select a final design from candidates submitted by prime contractors or other sources. Tooling design requirements are being defined which will allow competing designs to be constructed for the test program.

The motor redesign team has been managed on an interim basis by James E. Kingsbury, who now returns to his permanent position as director of the Marshall Science and Engineering Directorate. Most recently Thomas has been assigned to NASA's Data and Design Analysis Task Force, which is supporting the Presidential Commission investigating the Challenger accident.

-end-

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For Release:

May 10, 1986

NASA STATEMENT ON MAY 2 CLOSED-COMMISSION HEARING RELEASE

NASA has worked closely and cooperated fully with the Presidential Commission investigating the 51-L accident. The testimony at the May 2 closed commission hearing is part of a large amount of data supplied by NASA to the commission and includes other testimony, photographic materials, telemetry data and numerous additional records and analytical documents. The Agency will continue to respond fully to Commission requests for cooperation. NASA looks forward to receiving the Commission's full report about the cause of the accident and the Commission's recommendations.

- end -

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For Release:

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May 13, 1986

RELEASE NO: 86-59

NASA SUBMITS MAN-TENDED REPORT TO CONGRESS

A NASA study of a phased, evolutionary approach toward permanently manning the Space Station has concluded that while a "man-tended" approach is technically feasible and could accommodate certain user functions, the phased approach would force postponement of experiments important to advancement of manned spaceflight and would increase the total cost of developing the permanently manned Space Station.

Congress directed NASA to examine an option "which phases in the permanently manned features of the station as one of the reference Space Station configurations to be examined in the definition studies," and report the results of the study prior to selection of a baseline configuration for the permanently manned Space Station.

NASA is approximately one-half the way through an extensive 18-month-long definition and preliminary design (Phase B) period for the Space Station. The purpose of the Phase B study is to identify and evaluate alternative systems, components and philosophies resulting in a Space Station configuration that is responsive to the needs of potential users, cost-effective to operate and maintain and flexible in terms of growth, size and capabilities.

The difference between a man-tended and a permanently manned Space Station is that in a man-tended mode, people are at the station only when a Shuttle orbiter is docked to it. In this mode of operation, manning the station on a continuous basis would take place gradually over a 3-to-5-year period.

A man-tended Space Station would have the same basic configuration as the permanently manned station, according to the report. Instead of two modules, one primarily for laboratory functions and another for habitation, the man-tended station would contain a single, multipurpose laboratory module equipped with a partial environmental control system. Habitation facilities would be provided by the docked Shuttle orbiter. The power capability would be half of that planned for the permanently manned configuration, or 37.5 kilowatts, consisting only of solar arrays. The capacity of other utilities such as thermal control, data management and communications and tracking systems would be reduced to reflect the reduced user capability.

While the study estimates costs deferred between FY 1987 and 1991 by the man-tended approach to be approximately \$284 million in 1984 dollars, the total cost of a man-tended capability for 3 years as a phase prior to achieving full permanently manned capability is approximately \$1 billion. The report points out: "If operated in a man-tended mode for several years before achieving permanently manned capability, the small near-term savings achieved by these cost deferrals are offset by the costs of both operating the station in a man-tended mode and maintaining the industrial base during the delay period before resuming assembly of the permanently manned Space Station."

In assessing the impact to users of a man-tended Space Station, the study found that materials processing, technology development and life sciences research would be affected the most. For example, out of 37 material processing missions examined, 33 could not be accommodated on a man-tended Space Station. For technology development missions, 33 of 54 could not be performed on a man-tended Space Station. Based on analysis of a total of 138 missions, the study found that 39 could be accomplished without change by the user and 93 could not be performed at all. The report states, "Customer services that might be performed in the man-tended mode include servicing of attached payloads which could support research in solar physics, plasma physics, Earth observations and astrophysical and planetary sky surveys for cosmic rays, gamma rays and new planetary systems."

The recently completed systems requirements review has resulted in a recommended baseline configuration and assembly sequence for the permanently manned Space Station. According to the report, the currently recommended assembly sequence places a laboratory module in orbit before full utility capability is achieved and before habitation is added. Thus, it would be possible to perform certain servicing functions and experiments early in the program while proceeding to add the elements which would then result in the full, permanently manned Space Station.

Preliminary analysis of the results reveals that the Amazon tropical forests have a major influence on the chemical composition of the overlying atmosphere. As air transects the Amazon basin, with a flow regime from the Atlantic Ocean to the Andes, the forest soils and vegetation emit gases and aerosols (particles) into the lower atmosphere (boundary layer), setting off a series of chemical reactions which eventually impact global air quality and the Earth's radiation budget.

Measurements of nitric oxide (NO), from ground sites and the NASA research aircraft, demonstrate that the tropical forest ecosystems of the world play a particularly important role as a source of these important atmospheric gases. Forest vegetation produces copious quantities of organic vapors and particles which create a unique chain of events, leading to acid rain. The acid rain in the Amazon is generated by weak organic acids of natural origin.

Interestingly, the unique character of pollutants emitted by human activities in Manaus, the largest city in the central Amazon, reduce the acidity of local rainfall. This is in sharp contrast to the situation in North America and Europe where pollutant emissions of sulfur and nitrogen gases acidify rain. The composition of aerosols over the tropical forest also are very different from aerosols over North America and Europe.

Natural organic carbon makes up greater than 80 percent of the aerosol mass. The chemical composition of aerosols changes as inflowing ocean air transects the Amazon basin, and frequent rain storms remove sea salts and mix forest aerosols up into the tropical atmosphere. Large convective thunderstorms typical of tropical regions can transport rain forest gases and aerosols to altitudes of greater than 6 kilometers, where they become integrated into the global atmospheric circulation.

During the GTE/ABLE measurement period, the central Amazon basin and regions to the south became increasingly dry. Satellite observations by Brazilian at INPE showed a progressive increase in burning of dry lands related to agricultural management practices.

Carbon monoxide (CO), methyl chloride (CH₃Cl) and various hydrocarbon molecules, the emissions of aerosols from burning, were observed over the large areas of the Amazon by investigators on the NASA aircraft. Concentrations of CO increased from typical values of 90 parts per billion (ppb) during early stages of the dry season to values of 170 ppb as the impact of fire emissions on air quality became increasingly pronounced.

Atmospheric haze layers -- thought to originate from fires -- were common at altitudes in the Amazon Basin and in Savannah regions to the south of the Amazon and can influence the air quality of this remote region.

The GTE/ABLE aircraft measurement program and a collaborative NASA Amazon Ground Emissions (AGE) study made significant new advances by demonstrating new techniques for taking the "pulse" of vast, impenetrable tropical forests and floodplains. Measurements of carbon dioxide (CO₂) and methane (CH₄) were successful in documenting the rhythms of growth and decay of the biosphere over extensive areas of the Amazon. Such measurements will be critical to understanding how future changes in the extent of tropical forests may alter global air quality and climate. The NASA/INPE GTE/ABLE program is providing a foundation for future advanced technologies that will enable monitoring of critical biospheric and atmospheric resources from space.

May 20, 1986

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May 13, 1986

RELEASE NO: 86-60

FLETCHER BEGINS SECOND TERM AS NASA ADMINISTRATOR

Dr. James C. Fletcher became Administrator of NASA for the second time on May 12, 1986. The first man to head the nation's civilian space agency on two separate occasions, he was the fourth NASA Administrator from April 1971 to May 1977.

Upon leaving NASA in 1977 after his first term as Administrator, Fletcher accepted the William K. Whiteford Professorship of Energy Resources and Technology at the University of Pittsburgh, where he remained until May 1986. During this period, he also headed his own consulting firm, James C. Fletcher & Associates, McLean, Va.

Fletcher began his career in 1940 as a research physicist with the U.S. Navy Bureau of Ordnance, Washington, D.C. In 1941, he became a special research associate at Cruft Laboratory, Harvard University and, in 1942, he was an instructor at Princeton University.

In 1948, Fletcher joined Hughes Aircraft Co., El Segundo, Calif., where he served for 6 years. Later he joined Ramo-Wooldridge Corp.'s Guided Missile Research Division in Redondo Beach, Calif., which later became Space Technology Laboratories. In July 1958, with an associate, Fletcher organized and was first President of Space Electronics Corp., El Monte, Calif., which developed and produced the Able Star stage of the Thor-Able space carrier. After merger with a portion of Aerojet, Fletcher became President and then Chairman of the newly-formed Space General Corp. Later he served as Systems Vice President of Aerojet General Corp.

In 1964, he became the eighth president of the University of Utah, a post he held for 7 years.

As a research scientist, Fletcher has developed patents in sonar devices and missile guidance systems. He has been associated with the President's Science Advisory Committee, 9 years as a member of subcommittees and 4 years as a member of the committee itself, and has served on several Presidential task forces and many government-industry committees.

He is a Fellow of the Institute of Electrical and Electronics Engineers, American Institute of Aeronautics and Astronautics, the American Academy of Arts and Sciences, the American Astronautical Society and was elected to the National Academy of Engineering. He was a recipient of the first Distinguished Alumni Award of the California Institute of Technology and holds an honorary doctorate from the University of Utah.

Born June 5, 1919, in Millburn, N.J., Fletcher received a B.A. degree in physics from Columbia University in 1940 and a Ph.D. in physics from the California Institute of Technology in 1948.

He is married to the former Fay Lee of Brigham City, Utah. They are the parents of three daughters and one son.

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May 14, 1986

RELEASE NO: 86-61

NASA ANNOUNCES BASELINE CONFIGURATION FOR SPACE STATION

NASA Administrator Dr. James C. Fletcher today announced the selection of a baseline configuration for the permanently manned Space Station. This configuration will be used to guide preliminary design activities for the remaining 8 months of the Phase B (definition and preliminary design) studies.

The announcement came after more than a year of study by NASA centers and contractor teams during which the overall architecture of the station was defined and specific subsystems for operating the Space Station were chosen.

Acting Associate Administrator for the Office of Space Station John D. Hodge described the baseline Space Station configuration at a news conference today in Washington, D.C.

President Reagan directed NASA in January 1984 to develop a permanently manned Space Station within a decade. Definition of Space Station architecture and subsystems began in April 1985 with the selection of eight U.S. aerospace companies to perform the detailed definition and preliminary design studies under contract to four NASA centers. The Space Station reference configuration used as a starting point for conducting the definition studies included unmanned free-flying platforms and a manned base called the "power tower."

Important changes in the reference configuration of the Space Station have been made in response to user requirements. The "dual keel" Space Station provides for a better microgravity environment (10-5Gs for all modules), increases useable area on the structure for attaching external payloads, allows better pointing accuracy due to the stiffer structure and reduces traffic through the laboratory modules.

As part of their definition activities, NASA and the contractors also studied the approach of initially man-tending the Space Station by phasing in the permanently-manned aspects of the program over a 3-to-5-year period. The current planning scenario for the baseline configuration can incorporate this man-tended approach, enabling a future decision on phasing in the permanently manned feature of the station. A report on this man-tended approach has been submitted to Congress.

A total of 14 Space Shuttle flights are required for assembly of the baseline Space Station configuration. Attached payloads and the laboratory module are scheduled to be carried up early in the assembly sequence to provide a useful capability for conducting early scientific operations prior to the addition of the habitation module. Two additional flights from the West Coast will be required to place the two planned polar platforms into orbit.

The current schedule calls for NASA to begin development of the Space Station in October 1986 with the contracts for actual hardware development slated for negotiation and signature in the spring of 1987. First element launch would occur in 1993, with a useful, permanently habitable station in place in 1994. The remaining elements required to complete assembly of the Space Station would be launched over the next 2 years.

Major features of the baseline configuration are:

- * Dual keel configuration consisting of two vertical keels 361 feet long, connected by upper and lower horizontal booms 146 ft. long. The former reference configuration consisted of a single keel 400 ft. long. The Space Station now measures 503 ft. at its widest point from tip to tip of the transverse boom on which the power modules are mounted. The truss building block selected is a 16.4-ft. cube and is erectable by astronauts during extravehicular activity (EVA) and assisting fixtures. Struts will be made up of individual 2.12-inch outer diameter, .060-inch thick tubes of a graphite/epoxy composite material.
- * Two 44.5-ft. long, 13.8-ft. interior diameter U.S. supplied modules with external interconnects. The reference configuration was four 35-ft. long modules with internal interconnects. Useable volume provided by two baseline-size modules is approximately the same as four reference-size modules. One U.S. module will provide laboratory functions and the other will be used for crew quarters. Baseline configuration also includes two smaller logistics modules 24.1 ft. long. One logistics module will be attached to the station for on-orbit use while the other is being replenished on the ground. Flights to exchange logistics modules will occur on approximately 90-day cycles. Module structures will be formed from aluminum waffle panels formed into four cylindrical and two conical segments. The habitation module will include a capacity to maintain up to eight crewmembers.

- * Location of modules near the station's center of gravity to provide the best possible microgravity environment for experiments. The reference configuration had modules clustered at the bottom of the single keel.
- * Raft module pattern with four nodes and two tunnels to serve as module interconnects. The new configuration frees up the maximum useable volume inside the modules. The reference was racetrack configuration where modules were directly connected to each other. Nodes and tunnels will be made of aluminum. Nodes will be 12 ft. in diameter and have six 6.7-ft. diameter berthing ports. Tunnels will be 12 ft. long and 6.7 ft. in diameter.
- * Internal module pressure of 14.7 per square inch and 80/20 nitrogen/oxygen mixture ratio to approximate sea level Earth atmospheric conditions. This atmosphere is compatible with the existing data base for life sciences experiments and due to its normal oxygen content will minimize flammability problems and ease constraints on materials that can be used inside the modules.
- * Closed-loop environmental control and life support system. Oxygen and water (including wash water and urine, but excluding fecal water) will be recycled. Potable water will be distilled and nitrogen and food will be resupplied.
- * Hybrid solar power system with 75 kilowatts of power at completion of station assembly period. Reference configuration used only photovoltaic system. The hybrid system will be designed so that 25 kilowatts are provided by the photovoltaic system and 50 kilowatts are supplied by the solar dynamics system. Nickel-hydrogen batteries will provide storage for the photovoltaic system to handle eclipse periods. The primary power distribution system is still under review.
- * Five locations on the structure for placing attached payloads and a facility for servicing free flying spacecraft and platforms. Payload attach equipment could support four or more individual payloads. Possible locations include three on upper boom, one on left keel and one on lower boom. Two coarse pointing systems designed for accuracy of 1 arc minute also will be provided.
- * Telerobotic servicer as a part of the baseline configuration. The servicer will be compatible with astronauts on EVAs or with mobile remote manipulator system for servicing attached payloads and free-flying spacecraft. Future application of the robotic servicer as a "smart" front end for an Orbital Maneuvering Vehicle is planned.

- * Polar platform with useful payload on single Shuttle launch. Platform will have maximum equipment commonality with the Space Station such as solar arrays and nickel-hydrogen batteries.
- * Co-orbiting platform with systems common to polar platform and manned base which can be used to support astrophysics and materials processing.
- * Gaseous hydrogen/oxygen propulsion system for altitude boost with four modules located on the four quadrants of the Space Station. Thrusters on the propulsion modules will be in the 11.3-to-56.3-pound thrust range.
- * Assembly altitude of 220 nautical miles. Operational altitude will be 250 nautical mi. minimum. Frequency of periodic reboost of station to operational altitude will be determined by solar activity.
- * Metric as standard unit of measurement. Deviations permitted only where costs of implementing metric are unreasonable.
- * Inclusion of international elements into the overall design, including the Canadian Mobile Servicing Center (MSC) and hardware provided by Japan and the European Space Agency. The MSC will include the Space Station remote manipulator system, end effectors, servicing tools, control stations and special purpose dextrous manipulators. NASA will provide the mobile capability for the MSC's base structure. Japan is conducting preliminary design on a pressurized laboratory module with a local manipulator arm, attached work deck for mounting payloads requiring direct exposure to space, and an experiment logistics module. Discussions with ESA will continue to focus on a permanently attached pressurized laboratory for life sciences and materials experiments, a polar platform and a co-orbiting platform.

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For Release:

May 15, 1986

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RELEASE NO: 86-62

NASA AND BOEING SIGN MATERIALS PROCESSING AGREEMENT

NASA and Boeing Aerospace Company, Seattle, Wa., have entered into an agreement to fly a series of materials processing experiments on the Space Shuttle.

Objective of the experiments is to prove that crystals of a size and quality impossible to create on Earth can be produced in space. These crystals are expected to be of a type valuable in the commercial production of semiconductor and electro-optic devices.

The experiments involve the manned operation of a chemical vapor transport crystal growth furnace which will be installed in the galley area of the Shuttle orbiter mid-deck compartment.

Boeing expects to fly a total of three separate furnaces on each of the three flights. The University of Alabama, Huntsville, with which Boeing is affiliated under the NASA program of Centers for the Development of Space, also will perform experiments in the Boeing furnaces during the flight program. There is an option for two additional flights for prototype production experiments if the program yields promising results.

Under the agreement, Boeing will fund the experiments, provide the crystal growth furnace and other needed equipment. Boeing also will process some NASA samples in its furnace on each flight. NASA agrees to integrate the experiment packages into the Space Shuttle, provide available off-the-shelf support equipment where applicable and provide room and crew support on Shuttle flights.

NASA's involvement in this agreement and others underscores the agency's commitment to the development of commercial endeavors in space, particularly in relation to the Space Station, which NASA plans to have operational in the 1990s.

- end -

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RELEASE NO: 86-63

NEW ASTEROID/COMET NUCLEI HAZARD STUDIES ANNOUNCED

New studies of the hazards posed by asteroids or comet nuclei colliding with the Earth, based on analyzing old craters on the Earth and Moon, have been announced by astronomers performing research for NASA.

In two papers delivered May 20 at the annual meeting of the American Geophysical Union in Baltimore, Md., the scientists estimate that a collision by a large asteroid could be catastrophic. The chances of such an event occurring in the next century, however, are extremely remote.

A scenario of greater concern, they said, would be a far more probable encounter with a smaller object, a large meteoroid. Objects of that size explode when they enter the atmosphere. Such an explosion could be mistaken by some of the world's less technically advanced nations for a nuclear attack, prompting undesirable political consequences.

The papers were authored by Dr. Alan Harris, a Jet Propulsion Laboratory planetary scientist, and Dr. Eugene Shoemaker, a U.S. Geological Survey scientist who serves in NASA's Planet-Crossing Asteroid Program.

In one paper, Harris and Shoemaker estimated that the odds of an asteroid or comet nucleus one-third mile in diameter or larger hitting the Earth in the next 100 years are only 1 in 1,000.

In the other paper, Shoemaker calculated the effects of collisions by asteroids of various sizes. An asteroid one-third mile in diameter would release energy equivalent to 10,000 megatons of TNT and leave a crater six miles in diameter.

Despite the low probability of such a collision, the astronomers said, systematic sky searches for near-Earth asteroids, combined with advance emergency planning, are prudent steps to reduce further the possibility of an unexpected disaster.

"Increase in the discovery rate of these objects from an average of 3 to about 30 per year can be achieved with a moderate level of research support," Harris said.

Over 30 to 50 years, he said, most Earth-crossing asteroids down to about one-third diameter can probably be discovered.

If a collision was foreseen, it would be possible to predict the time and impact location with high accuracy, allowing the threatened area to be evacuated.

Some day, Harris noted, it may be possible to avoid a collision altogether, either by modifying the asteroid's orbit or breaking it up into a relatively harmless swarm of smaller pieces. The energies required for either strategy would require thermonuclear energy.

Comets are more difficult to predict than asteroids. Asteroids usually occupy orbits similar to the Earth's, making the object visible longer in advance if it were to approach the Earth. Comet orbits, on the other hand, are highly elliptical, bringing them in from the outer solar system with less advance warning.

Nevertheless, tracking of the comet and evacuation of the impact area would be practical means of avoiding a major disaster.

The scientists emphasized that such large events are extremely improbable, placing more concern on the effects of a meteoroid up to about 330 feet in diameter entering Earth's atmosphere. Events of that size are estimated to occur once every few decades. One such event was probably responsible for a nuclear-device-like explosion over Tunguska, Siberia in 1908.

The world's most technically advanced nations would be able to identify such a meteoric fireball for what it is. Nations lacking that technical ability, however, could mistake the fireball for the air burst of a nuclear weapon and attempt retaliation against hostile neighbors.

That issue, they recommended, should be addressed at the international level.

Harris and Shoemaker arrived at their statistical probabilities by analyzing and dating craters around the Earth and on its Moon.

- end -

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For Release:

May 20, 1986

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RELEASE: 86-64

AMAZON FORESTS SIGNIFICANTLY AFFECT GLOBAL AIR QUALITY

Analysis of a major atmospheric study indicates that natural emissions of gases from the rain forests in the Amazon Basin in Brazil set off a chain of chemical reactions that eventually impact global air quality and the Earth's radiation budget.

The Global Tropospheric Experiment/Amazon Boundary Layer Experiment (GTE/ABLE) was a joint U.S./Brazilian expedition conducted by NASA and the Instituto de Pesquisas Espaciais (INPE) in July and August 1985.

Ground-based and airborne measurements within and above the Amazon region were augmented by data from Landsat and Geostationary Orbiting Environmental Satellite (GOES) to study the influence of the world's largest tropical rain forest on the troposphere.

Data collected from the extensive measurements confirm a major influence on the chemical composition of the overlying atmosphere by the tropical forests. The extensive biological activity in the forest soils and vegetation emits gases and aerosols into the lower atmosphere as air transects the Amazon Basin with a flow from the Atlantic Ocean in the east to the Andes Mountains in the west.

Then, large convective thunderstorms over the Amazon, typical of tropical regions, remove the sea salts from the air and mix the forest gases and aerosols into the atmospheric boundary layer, from which they are carried aloft to altitudes of greater than 4 miles and become integrated into the global atmospheric circulation.

- more -

Measurements of carbon monoxide (CO) and other gases, emitted from ground sites and measured by sensors, indicated that the world tropical forest ecosystems play a particular role as the source of important atmospheric gases.

The forest vegetation produces large quantities of organic vapors and aerosols which leads to a "natural" acidic rain over this region.

In contrast to North America and Europe, measurements indicate that human activities in Manaus, the largest city in the central Amazon, reduce the acidity of local rainfall.

Composition of the aerosols over the tropical forest are different from aerosols over North America and Europe. Over the Amazon basin over 80 percent of the aerosols result from natural organic carbon.

A NASA Electra aircraft was used to make in situ and remote measurements of atmospheric trace gases and aerosols during flights over the Amazon basin. Measurements were taken during approximately 75 flight hours, encompassing a variety of flight patterns to study the exchange of gases between the forest canopy and the troposphere under different meteorological conditions. The aircraft measurements were complemented by surface and tethered balloon measurements and by measurements from lakes and rivers.

Program manager for GTE/ABLE was Dr. Robert J. McNeal, NASA Headquarters. The project was managed by James M. Hoell, Jr., of the NASA Langley Research Center, Hampton, Va., and Robert C. Harriss, also of Langley, was project scientist. The Brazilian coordinator for INPE was Luiz C. B. Molion. The coordinator for INPE's facility was Adauto G. Motta.

Detailed results of the findings will be presented at the spring meeting of the American Geophysical Union in Baltimore, May 20.

Twenty-seven papers will be presented during the day-long special session. The session will describe results obtained during the GTE/ABLE mission by more than 80 scientists from NASA, INPE and American and Brazilian Universities.

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NASA News

National Aeronautics and
Space Administration

Washington, D.C. 20546
AC 202-453-8400

Debra J. Rahn
Headquarters, Washington, D.C.
(Phone: 202/453-2754)

For Release:

May 21, 1986

Linda S. Ellis
Lewis Research Center, Cleveland, Ohio
(Phone: 216/433-2900)

RELEASE NO: 86-65

SPACE STATION AUXILIARY THRUSTER TECHNOLOGY DEMONSTRATED

Successful ground testing of a unique auxiliary propulsion system for Space Station marks a milestone in NASA's program to demonstrate that such thrusters can operate for long periods with no hardware degradation.

A key element in this new technology development is the viability of using the electrolysis of water onboard Space Station as the propellant source for the thrusters. In this process, water is broken down into hydrogen and oxygen and these gases are then burned as the fuel.

The tests were recently conducted for NASA's Lewis Research Center, Cleveland, by Bell Aerospace Textron, Buffalo, N.Y., and Aerojet TechSystem Corp., Sacramento, Calif. Under parallel contracts awarded in 1985, the two companies are charged with design, fabrication and test of small (25-to-50-pound) thrusters based on technology developed by NASA's Office of Aeronautics and Space Technology.

The thrusters ran for as long as 22,000 seconds. With a target of some 10 years of Space Station life, a run of 40,000 to 60,000 seconds is the goal. Banks of these thrusters will be used onboard Space Station to maintain proper orbit and attitude.

-end-

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NASA News

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Leon N. Perry
Headquarters, Washington, D.C.
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For Release:

June 2, 1986

Brian Welch
Johnson Space Center, Houston, Texas
(Phone: 713/483-5111)

RELEASE: 86-68

LUNAR SOIL PRODUCES HIGH GRADE CONCRETE MATERIAL

Experimenting with 1/3 cup of NASA-supplied lunar soil samples, scientists recently created a concrete product stronger than concrete made with Earth materials.

Researchers at the Construction Technology Laboratory (CTL), Skokie, Ill., studied the strength and characteristics of the lunar sample to determine its suitability as an ingredient of construction grade concrete. Preliminary results revealed that concrete material made from lunar samples achieved a strength of 10,800 pounds per square inch (psi). This is about 5 percent stronger than equivalent, high-strength Earth concrete.

According to Dr. T.D. Linn, CTL principal research engineer, tests performed on a 1-inch cube and three slabs of lunar concrete provide evidence that lunar material will be useful for building concrete structures on the moon. "We are quite pleased that early results show the lunar concrete is of a higher quality than any developed using Earth materials. In previous tests, over a one-and-a-half-year period, using quartz sand, the highest rating attained was 10,260 psi," said Linn.

Current American Concrete Institute standards require a rating of 4,000 psi for slab and 5,000 psi for column, the most critical requirement in constructing buildings.

Linn said prior to the tests, the lunar soil was examined under a scanning electron microscope to determine its physical properties and appeared to make good concrete material. He added that lunar concrete contained no organic substances as is found in Earth concrete materials, which generally is considered an impurity.

The lunar soil sample was allocated to the Linn research team by NASA's Johnson Space Center, Houston, where the lunar rock collection is housed. The repository contains nearly 850 pounds of lunar material returned to Earth by Apollo astronauts from six manned missions to the moon.

According to repository curator Dr. Doug Blanchard, "In supplying Dr. Linn and his associates with the lunar sample, we had hoped to study how we might use some of these materials to make a lunar base a viable opportunity. The results from Dr. Linn's investigations are very interesting. The fact that lunar cement behaves like high quality concrete made with Earth materials proves that it apparently works."

NASA planners anticipate a return to the moon after the turn of the century and the establishment of a permanent lunar base. Such a facility would require a variety of construction techniques designed for long-term life support in the harsh environment of the moon.

Emphasizing that the results are preliminary, Dr. Wendell Mendell, Johnson planetary scientist said, "These results, while they are preliminary in nature, are extremely interesting. We want to see what additional conclusions can be obtained from further examination of the data." Explaining the significance of the lunar soil tests, Dr. Mendell said, "Concrete is one of several materials being considered for building on the moon. If you can make a brick on the moon, you save a great deal of money. That's a tremendous incentive for learning to use lunar materials."

The proposal to study lunar soil as a possible source of building materials was made by CTL in 1984. The Lunar and Planetary Sample Team, a peer review panel which advises the lunar materials program at Johnson, approved the proposal to provide the lunar sample for study in the fall of 1985.

CTL is a non-profit research facility sponsored by the Portland Cement Association. Results from the lunar soil tests will be made available to the general public.

- end -

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NASA News

National Aeronautics and
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Washington, D.C. 20546
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Leon N. Perry
Headquarters, Washington, D.C.
(Phone: 202/453-1547)

For Release:

June 2, 1986

Mack R. Herring
National Space Technology Laboratories, Miss.
(Phone: 601/688-3341)

RELEASE: 86-69

NASA SPACE TECHNOLOGY ENHANCES DISEASE DETECTION

Scientists and medical researchers at NASA's National Space Technology Laboratories (NSTL), Bay St. Louis, Miss., are using satellite remote sensing technology to assist in developing a new method of analyzing the human body, including disease detection and tumor and blood clot analysis.

The use of advanced remote sensing technology as a medical research tool in a new body scanning technique, known as nuclear magnetic resonance (NMR), began in April 1985. The project is a 3-year collaborative effort between Washington University's Mallinckrodt Institute of Radiology, St. Louis, Mo., NASA Kennedy Space Center, Fla., and NSTL.

According to Doug Rickman, one of two NSTL Earth Resources Laboratory scientists working on the project, NMR hardware has been in existence since the 1940s. However, it has been used recently as a diagnostic tool by physicians. NMR scanning is regarded as an improvement over CAT SCAN, an X-ray technique sensitive to bone density. NMR, however, is sensitive to soft tissue and allows doctors to make more accurate diagnosis of diseases because of NMR's capability to show images of soft tissues in the body.

At NSTL, Rickman and fellow scientist Jim Anderson have applied the NASA-developed software, used in processing satellite imagery, to enhance the NMR images. This process is expected to improve the accuracy of disease detection. By incorporating the software into the system, NMR scans provide better information on a tumor's size and location as well as its biological attitude. Doctors can more easily get an accurate status of a tumor's mass without having to enter the body surgically.

The cooperative effort between NASA and Washington University began in 1980 because of the similarity of multispectral medical data and multispectral satellite data. However, NMR-produced data are black-and-white images and, therefore, are difficult to interpret. Currently, the images resemble X-rays and are treated as such by doctors making diagnosis.

NASA scientists hope to make medical diagnosis simpler by assigning color values to enhance the computer images. Kennedy Space Center, in a joint effort with the University of Florida, made the initial color composites. The work at NSTL seeks to improve the enhanced color images by training the NMR scanner to be consistent in identifying similar materials in the body, as a means of insuring the unit's maximum use potential.

Richman said: "The color images ease the physician's task, which should make it more accurate in the long run. It is quite difficult to interpret the black-and-white images but simple to interpret the color ones."

Dr. Michael Vannier, radiologist and principal project investigator, believes the union with NASA is vital to maximize the potential of NMR scanning. "No one in medicine really has the kind of experience with classifying or##., expressed interest in NMR because of its potential use in breast diagnostic techniques. Doctors John Gohagen and Ed Spitznagel, both of Washington University, were selected by the Cancer Institute to work along with Vannier, as representatives of the institute-sponsored Breast Imaging Project.

Gohagen emphasizes the importance of close affiliation with pathologists while working with actual cases to determine the accuracy of image classification. He said, "Our goal is to get the kind of discrimination necessary to distinguish anomalous conditions. For example, blood clots will appear distinctly different from benign tumors and a marked difference will be evident between benign and malignant tumors."

Explaining the project objective, NSTL scientist Anderson stated, "The NMR images in their present black-and-white format are useful to the physician, but we're talking about a quantum leap forward using NASA image processing. Our purpose is to produce a product which can be used by the physician to enhance or finalize the diagnosis."

"What we expect this type of technology to do," Vannier concluded," is to help us answer a lot of very specific questions that influence the management of patients. I think it will have a significant effect on what we do in the future."

- end -

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For Release:

Debra J. Rahn
Headquarters, Washington, D.C.
(Phone: 202/453-2754)

May 29, 1986

RELEASE: 86-70

NASA PLANS TO PROCURE REPLACEMENT TRACKING AND DATA SPACECRAFT

NASA today announced plans to procure a Tracking and Data Relay Satellite (TDRS) to replace the one lost in the Challenger accident.

Plans call for a replacement spacecraft and follow-on satellites to keep the TDRS system operational through the end of the century. NASA will procure the replacement spacecraft with parts for a second spacecraft from TRW, Electronics and Defense Sector, Redondo Beach, Calif., on a sole source basis. Value of the contract will be negotiated with TRW. Delivery of the replacement spacecraft is scheduled for September 1991.

A TDRS follow-on study will be initiated in late 1986 leading to a decision to competitively procure advanced, follow-on spacecraft with deliveries planned to begin in 1996.

The currently operational TDRS 1 is in geosynchronous orbit over the Atlantic Ocean just east of Brazil (41 degrees west longitude).

NASA will announce the plan to procure a replacement TDRS spacecraft in the Commerce Business Daily in the near future.

- end -

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NASA News

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Edward Champion
Headquarters, Washington, D.C.
(Phone: 202/453-8400)

For Release:
June 3, 1986
12:00 p.m. EDT

Daphne Gardiner
National Science Teachers Association, Washington, D.C.
(Phone: 202/328-5800)

RELEASE NO: 86-71

SPACE SCIENCE STUDENT WINNERS ANNOUNCED

The seven national winners of the 6th annual Space Science Student Involvement Program (SSIP) and the winner of the SSIP Student Newspaper Competition have been announced.

A joint venture of NASA and the National Science Teachers Association, SSIP gives secondary school students the opportunity to propose experiments which might be conducted in space.

The seven winning space science proposals were selected from the 1,500 submitted in the 1985-86 competition.

The winners and their teacher/advisors will be honored at a special space science symposium at the Kennedy Space Center, Fla. in August 1986. There the winners will formally present their proposals, tour the center and receive awards. The National Science Teachers Association will announce the top three winners who will receive scholarships.

The seven SSIP student winners are:

- o Irma S. Bateman, Lee-Davis High School, Mechanicsville, Va; "The Effects of a Microgravity Environment on the Torsion of Snail Shells"; Mary Elizabeth Gilman (teacher/advisor).
- o Timothy D. Beacom, North High, Sioux City, Iowa; "Ion Bombardment on Ice"; Mary F. Feddersen (teacher/advisor).
- o Alfred B. Cawthorne III, North Quincy High School, North Quincy, Mass.; "Low-G Osteogenic Abnormality"; Nancy S. McGrory (teacher/advisor).

- o Lisa M. Chow, Thomas Starr King Junior High, Los Angeles, Calif.; "The Effects of Microgravity on Genetically Engineered Escherichia Coli Production of Human Insulin, Interferon and Somatotropin"; Dr. Thomas J. Grgurich (teacher/advisor).
- o Kelly C. Dixon, Parma Senior High, Parma, Ohio; "The Effect of Microgravity on In Vitro and In Vivo Chick Osteogenesis"; Judith M. Lachvayder (teacher/advisor).
- o Amy Larson, Lincoln Senior High School, Sioux Falls, S.D.; "The Effect of Microgravity on Short and Long Term Memory"; Arlyn Thomas (teacher/advisor).
- o Jeffery A. Roberts, San Ramon Valley High School, Danville, Calif.; "The Formation and Resorption of Snail Shells in Microgravity"; Sidney B. London (teacher/advisor).

The SSIP Student Newspaper Competition gives high school newspaper staffs the opportunity to create and publish a promotional story concerning the SSIP, encouraging their peers to enter the program. This year's winner was Christine A. Anderson of North County High School, Desloge, Mo., with her article entitled "Student Experiments to be on Shuttle". Robert U. Montgomery is Anderson's teacher/advisor.

- end -

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For Release:

James F. Kukowski
Headquarters, Washington, DC
(Phone: 202/453-1548)

June 5, 1986

Frank O'Donnell
Jet Propulsion Laboratory, Pasadena, Calif.
(Phone: 818/354-5011)

RELEASE: 86-73

NEWLY DISCOVERED ASTEROIDS COULD PROVIDE FOR FUTURE SPACE MINING

Studies of the makeup of two newly discovered asteroids that could possibly provide the basis for future mining in space have been announced by astronomers and colleagues at NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif.

In work at several observatories, the astronomers have established that two near-Earth asteroids are probably composed chiefly of nickel-iron metal, much like some asteroids in the main asteroid belt and meteorites that impact Earth.

Astronomers previously suspected that such near-Earth asteroids were extinct comets. As such, they would have probably originated in the far outer solar system where comets are believed to have formed.

Nickel-iron asteroids, on the other hand, would have probably formed in the inner solar system. Most would have originated along with objects in the main asteroid belt orbiting the sun between Mars and Jupiter. Metallic near-Earth asteroids, however, may have begun as part of the cloud of material that condensed and became Earth.

One of the two asteroids studied, designated 1986 EB when it was discovered earlier this year, is known as an Aten-class asteroid -- one whose orbit is inside Earth's. The other, designated 1986 DA, belongs to the Amor class -- asteroids whose orbits are close to Earth's, but which are beyond Earth's orbit and do not cross it. Both are about one mile in diameter.

The observations were made by planetary astronomers Dr. Edward Tedesco of JPL and Dr. Jonathan Gradie of the University of Hawaii.

Using the 120-inch NASA Infrared Telescope at Hawaii's Mauna Kea Observatory, they found that the two asteroids have spectral qualities and albedo that put them in the same class as metallic asteroids of the main asteroid belt (albedo refers to an object's reflectivity). Astronomers study the light, or spectra, of an object to determine its chemical composition.

Tedesco made later observations at Arizona's Kitt Peak National Observatory with Dr. Robert Nelson of JPL and at Mauna Kea with Dr. Marc Buie of the University of Hawaii.

The astronomers noted that metallic asteroids near-Earth might provide suitable sites for future mining operations in space, as has been proposed to provide raw materials for possible interplanetary expeditions in the 21st century.

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Headquarters, Washington, D.C.
(Phone: 202/453-2754)

For Release:

June 11, 1986

Charles Mitchell
Lewis Research Center, Cleveland, Ohio
(Phone: 216/433-2889)

RELEASE: 86-74

NEW SUPER COMPUTER SUPPORTS KEY NASA PROJECTS

Predicting what happens to newly-designed aircraft engines, prior to their manufacture, is just one of the many complex functions performed by the newest super computer at NASA Lewis Research Center, Cleveland, Ohio.

Called the Cray X-MP, the computer was installed recently to assist Lewis scientists and engineers in key, wide-ranging research efforts. One such effort is developing mathematical models of jet engines and their components, including the study of air flow through inlet ducts, compressor turbine blades and exhaust nozzles. Modeling of combustion processes in aircraft engines and mechanical parts for indications of stress on bearings and turbine blades also is being performed with this super computer.

"A typical solution on the CRAY X-MP might take 1 hour, while the same solution would take 200 hours on a popular business mainframe computer," explains Dr. Allan R. Bishop of the Internal Fluid Mechanics Division. Bishop is a major user of the computer and is seeking answers on the reliability of structural design and the effects of solar radiation and temperature on internal fluid mechanics and spacecraft components.

Solutions to research problems, thought virtually impossible just 10 years ago, are being provided routinely by the CRAY X-MP. For example, Lewis engineers responsible for conducting thermal analysis of the Shuttle/Centaur avionics components are using geometric models of the components produced by the super computer to predict exactly where a component will be affected by solar radiation in space. "It is impossible to do the analysis without the super computer," Lewis researcher Rafael Sanabria said.

Through three dimensional computational analysis, the CRAY X-MP provides Lewis engineers the same results in 1 day that would take 100 days on today's popular business mainframe computers.

The type of research underway by Lewis' Structural Mechanics Branch would be prohibitively expensive and time consuming without the super computer. Its researchers seek answers to structures subjected to cyclic thermomechanical loading and inelastic straining of turbine blades and combustor liners in the hot sections of gas turbine engines.

Lewis' super computer also is being shared with other NASA centers, industry and universities. Universities using the computer include Cleveland State, Case Western Reserve, Ohio State, Northwestern and Rensselaer Polytechnic Institute.

-end-

NASA News

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For Release:

Sarah Keegan
Headquarters, Washington, D.C.
(Phone: 202/453-8536)

June 11, 1986

John Lawrence
Johnson Space Center, Houston, Texas
(Phone: 713/ 483-5111)

RELEASE: 86-75

ASTRONAUT GARRIOTT TO LEAVE NASA

Astronaut Owen K. Garriott, Ph.D., leaves NASA and government service this week after more than 20 years at the Johnson Space Center, Houston.

Highlights of Garriott's career include a 2-month stay in space aboard Skylab, July 28-Sept. 25, 1973, and the 10-day Spacelab 1 mission, Nov. 28-Dec. 8, 1983, on the Space Shuttle Columbia.

Garriott's plans include consulting and an active role in space research.

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June 13, 1986

Sarah Keegan
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RELEASE: 86-77

MISSION 51-E FLIGHT READINESS REVIEW VIDEO TAPE LOCATED

A video tape of the Shuttle mission 51-E Flight Readiness Review (FRR), containing approximately 2-1/2 minutes in which Larry Mulloy of the Marshall Space Flight Center, Huntsville, Ala., discussed previous O-ring erosion as it applied to the 51-E mission readiness, was located by NASA on June 4, 1986.

There is no STS program requirement to record audio or video of FRR's, however, some NASA locations did make such tapes. There was no formal cataloging, storage or other record of these tapes.

The existence of these tapes was not known by the NASA Task Force supporting the Presidential Commission until June 4, just prior to the release of the Commission report. This portion of a tape was located at MSFC and Marshall personnel immediately informed Admiral Truly of its existence. A copy was transmitted to NASA Headquarters and immediately provided to the Commission.

The Commission has indicated to NASA that no new information was contained in the tapes beyond that previously provided in the FRR briefing documents.

Four video tapes of the FRR's including 51-E have been located. Of these four tapes, 51-E is the only one in which O-ring erosion was addressed. NASA is ascertaining whether other tapes exist.

Special Announcement



Date: June 16, 1986

Subject: BRIEFINGS ON THE NEW LODGING PLUS REGULATIONS AND PER DIEM RATES

Public Law 99-234 authorized the Administrator, GSA, to prescribe regulations for a new method of reimbursement for employee travel and to establish per diem rates on a locality basis.

These new rates and new computation methodology become effective July 1, 1986.

This Legislation removed the statutory ceiling of \$75.00 per diem allowances and actual expenses reimbursement for travel within conterminous United States (CONUS) and authorized the administrative establishment (by GSA) of maximum per diem rates. This Legislation authorized the establishment of a lodging plus per diem system where reimbursement is based on the amount the traveler pays for lodging plus a fixed allowance for meals and incidental expenses (MIE). The total not to exceed the maximum per diem rate prescribed for a specific locality. Changes in the method of computing travel reimbursement have been incorporated.

There will be a total of four briefings on these changes over a two day period of time. The schedule is as follows: Please note that these briefings are for different audiences. (Personnel should attend only one).

Thursday's Schedule

<u>Date</u>	<u>Room No.</u>	<u>Building</u>	<u>Times</u>
6/19/86	5026	FOB-6	9:00 a.m. - 9:30 a.m. 9:45 a.m. - 11:30 a.m. 1:00 p.m. - 1:30 p.m. 1:45 p.m. - 2:30 p.m.

Friday's Schedule

6/20	625T	FOB-10B	9:30 a.m - 10:00 a.m. 10:15 a.m. - 12:00 p.m. 1:00 p.m. - 1:30 p.m. 1:45 p.m. - 2:30 p.m.
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The first 30-minute session in each briefing period is intended for those senior level personnel delegated authority by the Administrator to approve all travel for themselves and are authorized to redelegate this travel approval authority. This short session will generally describe the changes, the alternatives that are available, and the fund impact.

The second session in each briefing period is intended for all other personnel having a responsibility for travel and/or an interest in a detailed description of the new procedures, new computation methodology and preparation of all documentation required to support vouchers for reimbursement. It is essential that those personnel having a responsibility for the preparation and submission of vouchers for reimbursement attend one of these second period briefing sessions.

All travel authorizations for travel beginning on and after July 1, 1986, must be prepared to include the requirements set forth in the change.

All temporary duty travel beginning prior to July 1, 1986, and terminating after July 1, 1986, will be reimbursed consistent with the procedures now in effect through the period ending June 30, 1986. Reimbursement for that portion of the travel after July 1, 1986, will be on the basis of the rates and computation methodology that becomes effective on July 1, 1986. No amendment to an existing travel authorization will be required.



Richard J. Powell

Director, Financial Management Division

LBH (AA 86)

09-007

NASA News

National Aeronautics and
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Washington, D.C. 20546
AC 202-453-8400

Sarah Keegan
Headquarters, Washington, D.C.
(Phone: 202/453-8536)

For Release:

June 17, 1986

John Lawrence
Johnson Space Center, Houston, Texas
(Phone: 713/483-5111)

RELEASE: 86-78

ASTRONAUT JAMES VAN HOFTEN RESIGNS

Astronaut James van Hoften, Ph.D., veteran of two Space Shuttle flights, will resign from NASA to take a position within private industry.

Dr. van Hoften, 42, will work in the Defense and Space Organization of Bechtel of San Francisco. The exact date of his resignation has not been established but is expected to be this summer.

On each of his two Shuttle flights, Dr. van Hoften performed extravehicular activities to repair faulty satellites. On Mission 41-C, April 6-13, 1984, he and astronaut George D. Nelson repaired the Solar Maximum Mission satellite and returned it to orbit. With astronaut William F. Fisher on Mission 51-L, Aug. 27-Sept. 3, 1985, he performed on-orbit repair of SYNCOM IV-3.

Prior to joining NASA in 1978, Dr. van Hoften was an assistant professor of civil engineering at the University of Houston.

- end -

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Leon N. Perry or James F. Kukowski
Headquarters, Washington, D.C.
(Phone: 202/453-1548)

June 18, 1986

NOTE TO EDITORS

The Earth is a system. It's components encompass the biosphere, oceans, atmosphere and land masses. There has been a recent and belated realization that changes in one component affects the others. This is the emphasis of a report by the Earth System Sciences Committee (ESSC), a research panel of the NASA Advisory Council.

The ESSC report, entitled "Earth System Science, A Program For Global Change," will be released at a news conference jointly sponsored by NASA, The National Oceanic and Atmospheric Administration (NOAA), the National Science Foundation (NSF) and the National Center for Atmospheric Research (NCAR).

The conference will be held at NASA Headquarters on Thursday, June 26, 1986, at 11 a.m. EDT. Participants will include: Dr. James C. Fletcher, NASA Administrator; Dr. Anthony Calio, NOAA Administrator; Erich Block, Director, NSF and Dr. Francis Bretherton, NCAR. As Chairman of ESSC, Dr. Bretherton will conduct the news briefing. Technical representatives from NASA, NOAA and NSF also will attend the briefing.

The ESSC news briefing will be transmitted via NASA Select television on SATCOM F2R, transponder 13, 72 degrees west longitude, 3954.5 MHZ.

The media are advised to contact any of the following public affairs officers for additional information:

Laura McCauley, NCAR, 303/497-1153, Boulder, Colo.
Leon Perry/Jim Kukowski, NASA, 202/453-2548, Wash., D.C.
Bud Littin, NOAA, 202/377-8090, Wash., D.C.
Ralph Kazarian, NSF, 202/357-9498, Wash., D.C.

NASA News

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For Release:

Azeezaly S. Jaffer
Headquarters, Washington, D.C.
(Phone: 202/453-1922)

June 19, 1986

RELEASE: 86-79

HERBOLSHEIMER APPOINTED COMMERCIAL PROGRAMS DEPUTY

Lawrence F. Herbolsheimer has been appointed Deputy Assistant Administrator for the Office of Commercial Programs, NASA Headquarters, Washington, D.C. Herbolsheimer will be responsible for advancing the interests and participation of the private sector in the U.S. space program.

Prior to his government experience, Herbolsheimer was Corporate Planning/Business Development Manager in the International Division of Container Corp. of America, Chicago.

He is a co-founder of Vertechs Corp. (a technology development firm), Montgomery Foods, Inc. (a food distribution and marketing firm), Apex Corp. (a technology search firm) and Middle West Consultants, Ltd. (an international business consulting firm).

Until September 1985, Herbolsheimer served as Associate Director in the White House Office of Cabinet Affairs where he was responsible for developing and advancing policy issues of the Departments of Commerce, Transportation, Agriculture, the Office of the U.S. Trade Representative, Federal Communications Commission and NASA.

Herbolsheimer also was a Presidential appointee to the Commercial Space Working Group under the Cabinet Council on Commerce and Trade. He served as a representative to Executive Branch committees such as the Trade Policy Committee, the Senior Interagency Group on International Economic Policy and the Senior Interagency Group on Space.

-more-

Herbolsheimer holds a master of business administration degree from the Harvard Graduate School of Business Administration and a bachelor of arts degree in economics from Illinois Wesleyan University.

-end-

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For Release:

Sarah G. Keegan
Headquarters, Washington, D.C.
(Phone: 202/453-8536)

June 19, 1986
5:00 p.m. EDT

RELEASE NO: 86-80

NASA TERMINATES DEVELOPMENT OF SHUTTLE/CENTAUR UPPER STAGE

Following a meeting today with key Headquarters and NASA Center officials, Dr. James C. Fletcher, Administrator of NASA, announced his decision to terminate development of the Centaur Upper Stage for use aboard the Space Shuttle. NASA, under the direction of Rear Admiral Richard H. Truly, is initiating efforts to examine other alternatives for the major NASA planetary and scientific payloads which were scheduled to utilize the Centaur Upper Stage. NASA will provide assistance to the DOD as it examines alternatives for those national security missions which had planned to use Centaur. This decision will not affect Centaur programs other than those which were planning to use the Space Shuttle.

At the time of the Shuttle 51-L accident, the Centaur was in the final months of preparation for the then-scheduled 1986 launches of the Galileo and the Ulysses spacecraft for their exploration missions to Jupiter and the polar regions of the sun. Major safety reviews of the system were underway at that time, and these reviews were intensified in recent months to determine if the program should be continued. The final decision was made on the basis that even following certain modifications identified by the ongoing reviews, the resultant stage would not meet safety criteria being applied to other cargo or elements of the Space Shuttle system.

An independent study conducted by the surveys and investigations staff of the House Committee on Appropriations, Subcommittee on HUD-Independent Agencies, recently was provided to NASA by Chairman Edward P. Boland and Congressman William Green, the ranking minority member. The chairman and Mr. Green also concluded, based on the study, that the proper course at this time is to terminate the Shuttle/Centaur System Development and to seek other alternatives.

Fletcher announced his intention to appoint a NASA committee to review the history of the Shuttle/Centaur program and the events leading to this management decision. He also stated that, "although the Shuttle/Centaur decision was very difficult to make, it is the proper thing to do and this is the time to do it." He reaffirmed his commitment to the planetary science program and pledged to seek alternative solutions as quickly as possible.

- end -

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NASA News

National Aeronautics and
Space Administration

Washington, D.C. 20546
AC 202-453-8400

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For Release:
June 25, 1986
4:00 p.m. EDT

Terry Eddleman
Marshall Space Flight Center, Huntsville, Ala.
(Phone: 205/544-0034)

RELEASE NO: 86-81

ORBITAL MANEUVERING VEHICLE CONTRACTOR SELECTED

The National Aeronautics and Space Administration has selected TRW, Inc., Redondo Beach, Calif., for negotiations leading to the award of a contract for the full-scale design, development, test, verification and delivery of the Orbital Maneuvering Vehicle (OMV) flight vehicle including its Airborne Support Equipment (ASE), Ground Support Equipment (GSE), Ground Control Station (GCS), spares, tooling and support equipment. Included in the effort are plans and operations associated with the Design, Development, Test and Evaluation (DDT&E) for one flight. Grumman Aerospace Corp., Bethpage, N.Y., and SPAR Aerospace Ltd., Weston, Ontario, Canada, are team members.

The OMV is a reusable, remotely-operated propulsive vehicle that increases the range of the Space Transportation System. The primary uses of the OMV will be spacecraft delivery, retrieval, boost, deboost and close proximity visual observation beyond the operating range of the Space Shuttle. In addition, the basic vehicle will be configured in a way that will be readily adaptable to support Space Station activities.

TRW's proposal, including a priced option for one additional vehicle, reflected a proposed cost of approximately \$205 million. The contract will be on a cost-plus-award-fee basis. Anticipated basic period of performance will cover approximately 5 years.

Other firms submitting proposals for the contract were LTV Aerospace and Defense Co., Dallas, and Martin Marietta Corp., Denver.

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-2-

The OMV contract will be managed by NASA's Marshall Space Flight Center, Huntsville, Ala.

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NASA News

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Washington, D.C. 20546
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For Release:

June 26, 1986

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RELEASE NO. 86-82

NASA FLIES FIRST LARGE SCALE INTEGRATED AIRCRAFT SYSTEMS

The first flight of an aircraft with both a digital jet engine control system and a mated digital flight control system has taken place at NASA's Ames-Dryden Flight Research Facility.

A modified F-15 jet aircraft performed the maiden flight of the Highly Integrated Digital Electronic Control (HIDEC) system. HIDEC provides coordinating communication between the aircraft's experimental flight control computer and engine control computer for better performance.

The flight took place June 25, 1986, from the Ames-Dryden facility at Edwards, Calif., and marks the first time such large scale integration efforts have been attempted in aircraft systems. The research mission was flown by NASA test pilot Thomas C. McMurtry.

The integration of engine control and flight control computers is expected to provide significant aircraft performance improvements. The earlier Digital Electronic Engine Control (DEEC) system, which did not integrate with the flight control computers, provided engine performance and maintenance improvements. It allowed the engine to actively maintain its original engine thrust levels.

HIDEC uses a DEEC type engine control system but also adds flight control information such as altitude, Mach number, angle of attack and sideslip. The HIDEC system actively adapts to varying flight conditions, allowing the engine to operate closer to its stall boundary to gain additional thrust. Performance of the research engines used in the tests could be increased from "two to ten percent, depending on flight conditions," according to NASA Ames-Dryden HIDEC Project Manager, Gary Trippensee.

The HIDEDEC program, which will evaluate engine/aircraft performance gains by using large scale integration techniques, began its adaptive engine control system flight research phase with the maiden integrated flight and this phase is expected to continue through this summer. A later phase of the HIDEDEC program will investigate Integrated Flight Path Management including trajectory optimization for minimum time and fuel usage, complex optimum intercepts and four dimensional navigation.

Modifications of the HIDEDEC F-15 aircraft include a Digital Electronic Flight Control System manufactured by Lear Siegler and a Pratt & Whitney developmental PW1128 turbine engine propulsion system provided by the Air Force.

McDonnell Douglas Corporation is the principal contractor responsible for the integrated systems design. NASA's Ames-Dryden Flight Research Facility manages the HIDEDEC research flight program.

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For Release:

NOTE TO EDITORS

June 27, 1986

This fourth of July, to commemorate the Statue of Liberty's 100th anniversary, the symbol of American freedom will be rededicated after extensive renovation and refurbishment.

Corrosion protection for the interior structure was provided by a primer coating known as K-Zinc 531, an aerospace spin off product. The coating was developed by NASA as a means of protecting launch gantries and other structures at the Kennedy Space Center, Fla.

NASA material to support this story include:

Press Release No: 85-64

Phone: 202/453-8400

Video Tape (4:25 min.)

Phone: 202/453-8594

Radio Interview

Phone: 202/453-6572

Still Photos

Phone: 202/453-8375

B&W 85-H-135

Color 85-HC-110

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NASA News

National Aeronautics and
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Washington, D.C. 20546
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For Release:

June 30, 1986

RELEASE NO: 86-84

NASA ANNOUNCES SPACE STATION ASSOCIATE ADMINISTRATOR, NEW PROGRAM STRUCTURE

Andrew J. Stofan, Director, Lewis Research Center, Cleveland, today was appointed Associate Administrator for Space Station.

Stofan's appointment was announced by Dr. James C. Fletcher, NASA Administrator. The Space Station is a major program of the space agency.

Stofan has been director of Lewis since July 1982. Prior to his Lewis assignment, Stofan was Acting Associate Administrator for Space Science and Applications, NASA Headquarters, Washington, D.C.

In addition to the appointment, Fletcher announced a number of organizational and management structural actions, effective immediately, designed to strengthen technical and management capabilities in preparation for moving into the development phase of the Space Station program.

The decision to create the new structure comes as the result of recommendations made to Fletcher by a committee headed by former Apollo program manager Gen. Samuel C. Phillips who conducted a review of Space Station management as part of a longer-range assessment of NASA's overall capabilities and requirements.

Fletcher said the new Space Station management structure is consistent with recommendations by the Rogers Commission which investigated the Space Shuttle Challenger accident. The commission recommended that NASA reconsider management structures, lines of communication and decision-making processes to assure the flow of important information to proper decision levels.

Fletcher said the program will employ the services of a top-level, non-hardware support contractor. In addition to the systems engineering role, the Program Office will contain a strong operations function to ensure the program adequately deals with the intensive needs of a permanent facility in space.

A Systems Integration Field Office will be established as part of the Program Office organization and will be located in Houston. Fletcher said the new associate administrator will define the longer-term role of the Houston office, the role of the systems engineering and analysis function in Washington, and the schedule of development and transition of functions to Washington.

Project managers located at Goddard Space Flight Center, Greenbelt, Md.; Johnson Space Center, Houston; Kennedy Space Center, Fla.; Lewis Research Center, Cleveland; and Marshall Space Flight Center, Huntsville, Ala., will report functionally to the associate administrator. They will coordinate with their respective center directors to keep them informed of significant program matters.

In other actions, Fletcher has directed acting Associate Administrator for Space Station John D. Hodge to streamline and clarify NASA's procurement and management approach for the Space Station program and to issue instructions related to work package assignments, procurement of hardware and services, and selection of contractors for the development phase of the program.

In addition, Hodge also has been tasked to develop a program overview document that will spell out the role automation and robotics will play in the Space Station program and to conduct further studies in the areas of international involvement, long-term operations, user accommodations and servicing and issue detailed directions in the near future.

Fletcher has authorized NASA to proceed with the procurement of a Technical and Management Information System (TMIS), a versatile computer-based information network. It will link NASA and contractor facilities together and will provide engineering services, such as computer aided design, as well as management support on such things as schedules, budgets, manpower and facilities.

Since mid-April, Phillips has been examining the Space Station program from a technical as well as management perspective, as part of a broader look into the way NASA manages its programs, including relationships between the various space centers and NASA headquarters. His report reflects discussions with representatives from all the NASA centers and the contractors involved in the definition and preliminary design of the Space Station, as well as officials from other offices within NASA.

In his January 1984 State of the Union message, President Reagan directed NASA to develop a "permanently manned Space Station within a decade." NASA assigned responsibilities for various elements and systems of the Space Station to five of its space centers, and in April 1984, awarded 21-month long contracts to eight industry teams to conduct definition and preliminary design studies (Phase B). A baseline configuration was selected in May of this year to guide preliminary design activities through the remainder of the Phase B study. Development is scheduled to begin in the spring of 1987. Initial launch of Space Station elements is set for early 1993 with a permanently manned capability to be in place by 1994.

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